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ABSTRACT

This manual is intended to serve as a guide for those who are helping future Peace Corps Volunteers to acquire basic beekeeping skills. Included in the guide are lesson outlines and handouts for use in each of the 52 sessions of the course. Representative topics discussed in the individual sessions are family live-in, training site investigation, adult learning, assessment and selection, program evaluation, bee management techniques, training needs, and honey and beeswax products. Each lesson outline contains some or all of the following: a breakdown of the time to be spent on the session, an overview of the session, objectives, printed materials needed for the session or for background information, handouts, a list of necessary supplies and tools, and an outline of procedures to follow in order to meet the objectives of the session. (Appendixes to the guide include training objectives; guidelines for pretraining research, staff training, site selection, pretraining preparation, program management and administration, and alternate program design; a follow-up questionnaire; and a bibliography. (MN)

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Peace Corps

A MANUAL FOR TRAINERS
OF
SMALL SCALE BEEKEEPING DEVELOPMENT WORKERS

PREPARED BY CHP INTERNATIONAL, INC.

UNDER PEACE CORPS CONTRACT PC 282-1011

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June 1983

PREFACE

This manual represents a component of a pilot training program in beekeeping, undertaken by CHP International, Inc. under Peace Corps' Contract 282-1011.

We believe that our involvement has produced a valuable and adaptable training tool. However, the manual must continue to be tested, evaluated and modified in order to reflect changing needs and circumstances. It is our hope that you will contribute to that process and that you will help make the manual more appropriate and useful during future training programs. If you have observations or suggestions about the contents, methods or approach included in the manual, please contact the authors at the offices of CHP International, Inc.

ACKNOWLEDGEMENTS

There have been many valuable sources of support during the development of this manual. It is only with the help of many people that we have been able to document the various tools and techniques that we have chosen to use in the training program.

We are grateful to the following individuals for their contributions to the development of this manual:

Calvina Dupre
Sharon Flory
Larry Frankel
Gail Gunderson
Jim Kelly
Carol Martin
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Special thanks are extended to CHP/Costa Rica, whose training center was the site for the pilot training and whose staff provided valuable support to both trainers and Trainees. Thanks also to the community of Farallones Institute, whose pioneering efforts in manual design served as a model for many aspects of this manual.

Although we cannot mention them all by name, we also thank the many people who have contributed by giving us permission to use materials they have developed.

Finally, and perhaps most importantly, we extend sincere gratitude to the eleven Peace Corps Trainees who participated in the pilot training program that formed the basis for this manual. They came to learn and, in turn, taught us. It is with them that we shared hopes and values. We hope that their efforts as Peace Corps Volunteers will serve the world kindly and well.

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INTRODUCTION

This manual provides a guide for those who are helping future Peace Corps Volunteers to acquire basic beekeeping skills. The program is designed to help Trainees develop the skills they will need to work and live in another culture as beekeeping extensionists. This is a skills training program; thus, some further in-country training or orientation is presumed.

The emphasis of the program is on equipping future Volunteers with the skills necessary to promote appropriate beekeeping development. This is a creative process that requires individuals to take an active role in identifying their own needs and finding appropriate and sustainable ways to meet them. The program outlined in this manual creates a model of this process of development by encouraging Trainees to become actively involved in the design and implementation of their program. Trainees are urged to cooperate with others and identify and use the talents and resources available within the group. They practice skills that help to motivate others toward self-reliance. The emphasis placed on developing and reinforcing these skills reflects Peace Corps' belief that beekeeping expertise is valuable only when it is balanced with other qualities.

The approach to training used in this program is based on the principles of non-formal education and is designed to strike a balance between structured learning and independent discovery. By using the sessions, resources and methods outlined in this manual, Trainees will develop a working knowledge of beekeeping, as well as skills for applying that knowledge in a meaningful way.

The program is divided into fifty-two sessions which occur over a six-week period. Each session consists of a series of activities designed to meet specific training objectives. These objectives reflect the fundamental themes of the training program. These themes illustrate the connection and interdependence between beekeeping skills and other skills which are needed to live and function effectively as a development worker. The program themes include:

- Beekeeping
- Cross-Cultural Adaptation
- Basic Communication Processes
- Volunteer Personal Support
- Health and Nutrition
- The Role of the Volunteer in Development

HOW TO USE THE MANUAL

A thorough understanding of this manual is important in order to effectively implement the program. Included below are some guidelines and explanations to help in using the manual:

- The Six-Week Training Schedule indicates the overall design of the program and the sequence of sessions. Use it as a reference in developing a specific schedule which meets the needs of the particular training situation.

- Sessions follow a consistent format which is briefly explained on the following page. Be certain to read sessions thoroughly in advance. There are often several purposes to each session; for example, the procedures may be designed to meet a beekeeping objective and at the same time, provide Trainees with practice in group problem-solving or communication skills. It is important to study and understand the multi-tiered design of each session before presenting it.

- A family live-in which starts the first day of the program is an integral part of Trainees' adaptation to a new culture. Use this experience to involve the community and its members in relevant aspects of the training.

- The training program is designed to be responsive to a variety of training situations. Generally, sessions are designed to accommodate approximately twenty Trainees. If there are significantly more or fewer Trainees, or if the length of the program is changed, some modification of the procedures will need to occur. Modification and adaptation of the materials are encouraged. However, it is essential to strive to maintain the integrated nature of the program by consistently providing an adequate balance of emphasis among the various program themes.

Training is a dynamic process that responds to the training situation and to the needs of the participants. As such, any training manual can only serve as a guideline. The training schedule gives a logical sequence to the sessions. Many of the sessions are scheduled to occur several times during training; thus, both within the overall program structure and within the sessions themselves, there is flexibility, allowing the program to be adapted in order to respond to any particular training situation.

Session Format

SESSION NUMBER

TITLE

TOTAL TIME The total time scheduled for the session. Note in the schedule that some sessions are broken down and occur as a series of activities during training. These are sessions on topics such as construction, bee management, the Bee Fair, assessment and evaluation.

OVERVIEW A brief statement on how the session relates to the overall training program, the activities in the session and the expected outcomes.

OBJECTIVES

- Statements of what is expected of the Trainees in order to successfully complete the training program.

RESOURCES

- Printed materials needed for the session or useful for background information.
- Handouts follow some sessions. Each handout is coded to the corresponding session. Copies of handouts should be made in advance for distribution to the Trainees during the session.
- Attachments, which are also coded, follow some sessions and are intended as resources for the trainer.

MATERIALS Supplies and tools needed for the session.

PROCEDURES A series of steps to follow in order to meet the objectives of the session.

Trainer Note

○ Notes to further explain the activities of the session. These include such things as alternatives, scheduling considerations, suggestions and further directions to the trainer.

SIX-WEEK SCHEDULE

WEEK ONE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 1: Establishing Observation Hives - Group Resource Assessment (3 hrs., 30 min.) SESSION 2: Introduction to Family Live-in (3 hrs., 30 min., includes lunch)	SESSION 4: Defining Expectations (3 hrs.) SESSION 5: Assembling Protective Clothing (5 hrs.)	SESSION 5: (con't) Assembling Protective Clothing (1 hr.) SESSION 6: Constructing KTBH's and Preparing the Apiary Site (3 hrs.)	SESSION 8: Adult Learning and An Introduction to Method Demonstrations - Basic Insect Anatomy (4 hrs.)	SESSION 9: Communication and Listening Skills (2 hrs.) SESSION 10: Establishing Individual Nucs (4 hrs.)	SESSION 12: Introduction to Assessment and Selection (2 hrs., 30 min.) SESSION 13: Introduction to Program Evaluation (1 hr., 30 min.)
SESSION 3: Training Site Investigation (2 hrs.) SESSION 1: (con't) Establishing Observation Hives (1 hr.)		SESSION 7: Bee Colony Cycle-Introduction to Trainee Facilitation (2 hrs.) SESSION 6: (con't) Constructing KTBH's and Preparing the Apiary Site (2 hrs.)	SESSION 6: (con't) Constructing KTBH's and Preparing the Apiary Site (4 hrs.)	SESSION 11: Functional Biology of the Honey Bee (2 hrs.)	

SIX-WEEK SCHEDULE

WEEK TWO

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 14: Bee Management Techniques (4 hrs.)	SESSION 17: Foraging (2 hrs.) SESSION 18: Hive Design Criteria and Swarm Boxes (2 hrs.)	SESSION 8: (con't) Method Demonstrations I (4 hrs.)	SESSION 19: Role of the Volunteer in Development (4 hrs.)	SESSION 22: Transferring Colonies (8 hrs.)	SESSION 23: Family Live-in Analysis (2 hrs.) SESSION 12: (con't) Assessment and Selection (2 hrs.)
SESSION 15: Basic Nutrition (2 hrs.) SESSION 16: Types of Bees and the Bee-Human Relationship (2 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	SESSION 20: The Bee Space and Types of Hives (2 hrs.) SESSION 21: Obtaining Bees (2 hrs.)		

SIX-WEEK SCHEDULE

WEEK THREE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 24: Queen Rearing (4 hrs.)	SESSION 26: Swarming, Supersedure, and Absconding (2 hrs.) SESSION 27: Culture Shock (2 hrs.)	SESSION 29: Visual Aids - Queen Rearing Preparation (4 hrs.)	SESSION 30: Extractors and Solar Mix Melters (2 hrs.) SESSION 14: (con't) Bee Management Techniques (2 hrs.)	SESSION 24: (con't) Queen Rearing (4 hrs.)	SESSION 32: Mid-Program Evaluation (4 hrs.)
SESSION 14: (con't) Bee Management Techniques (2 hrs.) SESSION 25: Health and Hygiene (2 hrs.)	SESSION 24: (con't) Queen Rearing (2 hrs.) SESSION 28: Constructing a Swarm Board and Swarms (2 hrs.)	SESSION 28: (con't) Constructing a Swarm Board and Swarms (4 hrs.)	SESSION 31: Women in Development The Role of Men and Women (4 hrs.)	SESSION 30: (con't) Extractors and Solar Wax Melters (4 hrs.)	

SIX-WEEK SCHEDULE

WEEK FOUR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 30: (con't) Extractors and Solar Wax Melters (8 hrs.)	SESSION 14: (con't) Bee Management Techniques (8 hrs.)	SESSION 33: Melliferous Plants (2 hrs.) SESSION 8: (con't) Method Demonstrations II (4 hrs.)	SESSION 24: (con't) Queen Rearing (2 hrs.) SESSION 14: (con't) Bee Management Techniques (2 hrs.)	VISIT	VISIT
		SESSION 12: (con't) Assessment and Selection II (2 hrs.)	SESSION 34: Preparation for Site Visit - Information Gathering (4 hrs.)	SITE	SITE

SIX-WEEK SCHEDULE

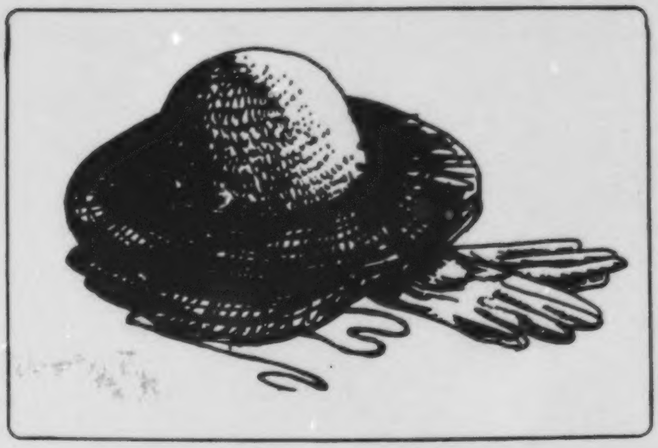
WEEK FIVE

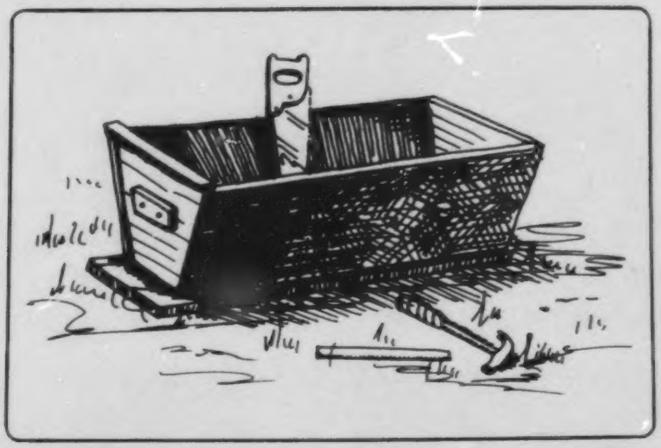
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 35: Site Visit - Follow-up and Conclusions (4 hrs.)	SESSION 30: (con't) Extractors and Solar Wax Melters (4 hrs.)	SESSION 36: Honey (2 hrs.) SESSION 37: Other Hive Products (2 hrs.)	SESSION 40: Beeswax Field Trip (4 hrs.)	SESSION 42: Project Planning and Development (4 hrs.)	SESSION 39: (con't) Bee Fair Preparation (4 hrs.)
SESSION 14: (con't) Bee Management Techniques (2 hrs.) SESSION 30: (con't) Extractors and Solar Wax Melters (2 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	SESSION 38: Anaphylactic Shock (2 hrs.) SESSION 39: Introduction to the Bee Fair (2 hrs.)	SESSION 41: Bees and Trees (4 hrs.)	SESSION 43: Creamed Honey and Beeswax Products (4 hrs.)	

SIX-WEEK SCHEDULE

WEEK SIX

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 44: Introduction to Final Assessment (1 hr.) SESSION 45: Cost Analysis and Project Evaluation (3 hrs.)	SESSION 42: Insecticides and Bees (2 hrs.) SESSION 48: Cooking with Honey (5 hrs., includes lunch)	SESSION 49: Introducing Innovation - Expectations Beyond Training (2 hrs.) SESSION 50: Future Training Needs (2 hrs.)	SESSION 39: (con't) The Bee Fair (4-6 hrs.)	SESSION 51: Site Restitution (8 hrs.) SESSION 12: (con't) Final Assessment and Selection (concurrent with Session 51)	SESSION 52: Final Program Evaluation (4 hrs.)
SESSION 14: (con't) Bee Management Techniques (2 hrs.) SESSION 46: Bee Diseases and Pests (2 hrs.)	SESSION 14: (con't) Bee Management Techniques (3 hrs.)	SESSION 39: (con't) Bee Fair Preparation (4 hrs.)	SESSION 39: (con't) Bee Fair Evaluation (2 hrs.)		





SESSION 1

ESTABLISHING OBSERVATION HIVES – GROUP RESOURCE ASSESSMENT

TOTAL TIME 4 hours, 30 minutes

OVERVIEW An observation hive allows one to view the internal workings of a bee colony. As such, it is an important teaching/learning tool when set up in a conspicuous place. This session gives the Trainees experience in setting up observation hives. Since this is a group activity, the hives will provide a focus for group identity during the training program.

While establishing the observation hives, an excellent opportunity exists for the Trainees to informally assess their own experience and skills in the apiary, as well as those of the staff. Following the period in the apiary, time is spent exploring other resources, interests and anxieties which the individuals bring to the training program and to their future Peace Corps work.

OBJECTIVES

- To get to know one another better.
- To set up two observation hives.
- To share entry-level skills and interests among staff and participants.
- To work in an apiary.
- To identify potential uses of an observation hive in a beekeeping program.
- To practice active listening and interviewing skills.

RESOURCES

-*Small Scale Beekeeping*, pp. 16, 194-195.
-*The Beekeeper's Handbook*, p. 118.
-*The Hive and the Honey Bee*, pp. 326-327, 461.

MATERIALS observation hives, nuc with ripe queen cells, sting kit (or adrenalin), smokers, matches, water sprayer, smoker fuel, water, hive tools, newsprint, markers

PROCEDURES

Trainer Note

- ○ Prior to beginning this session, select the colonies which will be transferred to the observation hives. Because no protective clothing will be available until a later session, it may be beneficial to hive well-fed artificial swarms into the observation hives.
- ○ This will be the first experience for many of the Trainees in working with a bee colony. Thus, it is important to continually stress the proper methods of working with bees and the precautions necessary to minimize stings.
- ○ Note that the final step of this session will occur during the final hour of the day.
- ○ The whole staff should attend this session in order to get to know the Trainees as well as to be a part of the resource assessment.

Step 1: **Name Game** (30 minutes)

Explain that an exercise for learning and remembering names will follow. State the guidelines and begin the "name game".

Trainer Note

- ○ Any one of several games for remembering names can be employed at this point. One game to use is as follows:

  Begin by giving your name, followed by a word which:
  - describes how you are feeling at that moment and
  - begins with the same first letter as your name (such as Bob Bashful, Mike Motivated, Gail Glorious).

  Moving around the group, each participant then takes a turn repeating the preceding names and descriptors and adds their name at the end of the growing list.

  The game ends when all of the participants have added their names and have tried to repeat the list.

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⬡ Do the "name game" in a comfortable area, as near to (or in) the apiary as possible. This may stimulate beekeeping descriptors to be added to the names.

Step 2: **Introduction to Working in the Apiary** (30 minutes)

List on newsprint and post on the side of a hive the objectives of this session. Explain them to the Trainees and encourage questions.

Light a smoker and approach a hive correctly. Return to the group and have several Trainees reenact the process.

Trainer Note

⬡ Some participants may receive their first stings during this work. As a precaution, make sure that a sting kit or adrenalin is readily available.

Step 3: **Setting Up the Observation Hive** (55 minutes)

Have the entire group approach and open the pre-selected hive.

Guide the Trainees in selecting appropriate frames for establishing the observation hives. Once the hives are filled and properly assembled, discuss the general impressions they have of this first experience with a hive.

Also, question the Trainees concerning the possible uses of an observation hive in beekeeping development work.

Since the hives will not be sited until evening, have the Trainees protect the glass hives from the sun and wind.

Step 4: **Introducing the Resource Activity** (10 minutes)

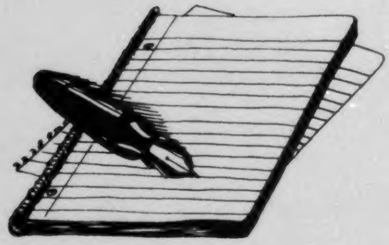
In a comfortable location, have the Trainees recall the overall objectives for this session. Explain to them the overall objectives for the day.

Begin to discuss the resources available within the group by asking the Trainees to identify any special skills and talents which they noted during the observation hive activity.

Step 5: **Interviewing** (30 minutes)

On newsprint, have the Trainees generate a list of 3-4 interview questions which will serve as a basis for determining group skills and interests. Include one "feeling" item in the interview list; for example: what anxieties do people have regarding pre-service training?

Have the Trainees divide into small groups and interview each other using the interview questions on the newsprint.



Trainer Note

○ While practicing these communication skills, it is important to keep the interviewing process focused on skills and interests and not expectations. Expectations will be covered later.

Step 6: **Interview Results** (45 minutes)

Reconvene the total group. Have each Trainee briefly summarize, on a list, the results of the interviews.

Summarize by asking some Trainees to give their overall impressions of the skills of the group. Draw links among the skills available and the interests of the group.

Step 7: **Summary of the Resource Activity** (10 minutes)

Focus on the interview process by asking Trainees to briefly describe any aspect of the process which seemed easy, difficult, awkward or effective.

Link interviewing techniques and the process of information-gathering to working in a different culture and to living with a host family.

Have the Trainees take a short break and then reconvene for the next session "Family Live-In".

Trainer Note

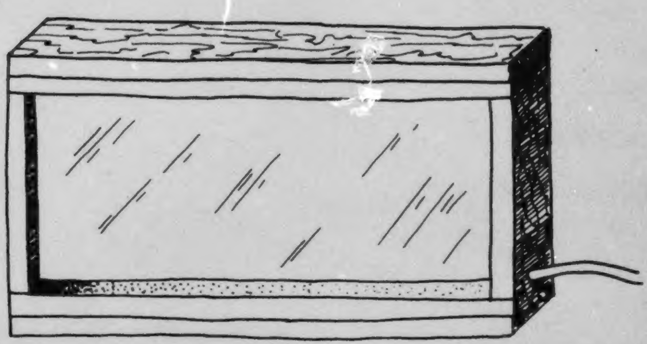
○ At the end of the day, following Session 3, "Training Site Investigation", complete Step 8 of this session.

Step 8: **Siting the Observation Hives** (1 hour)

Have a few volunteers move the observation hives from the apiary to their permanent sites, while the others prepare those sites.

Trainer Note

○ This step is scheduled for the late afternoon, so that the bees will have calmed down after placing the frames in the glass hives.



SESSION 2

INTRODUCTION TO FAMILY LIVE-IN

TOTAL TIME 3 hours, 30 minutes

OVERVIEW The family live-in is an excellent opportunity to develop and use community analysis skills. It enables Traineees to practice the skills necessary for successful cross-cultural adaptation. The purpose is to help Trainees to construct a framework for the development of these skills. This introductory session involves reviewing logistics, meeting the families, identifying specific skills to be used and developing specific goals to be accomplished.

Trainer Note

○ The set-up process for the family live-in will take considerable time and effort. Refer to Appendix D, "Site Selection and Pre-Training Preparation" for further suggestions.

OBJECTIVES

- To discuss the importance of the family live-in.
- To meet the families.
- To discuss feelings and initial reactions to the families.
- To begin to identify and discuss the meaning of contrasting cross-cultural behaviors.
- To identify specific skills which will be developed and used during the live-in experience.
- To develop a list of personal goals for the live-in.

RESOURCES

- Handout 2A, "Behavior Contrast Study Guide"
- Handout 2B, "Family Live-In Roles"

MATERIALS newsprint, markers, pens, paper

PROCEDURES

Step 1: **Orientation and Briefing** (15 minutes)

State the overall objectives of the live-in and briefly review the procedures of this session. Emphasize the importance of the live-in as a community evaluation tool. Review such things as logistics, emergency procedures, transportation needs and particular activities going on in the community. Assign each Trainee to an orientator. Distribute Handout 2B, "Family Live-In Roles" and briefly explain the responsibilities of the family, the orientator and the Trainee during the live-in experience. Encourage discussion and answer any questions the Trainees may have.

Trainer Note

○ An orientator should be assigned to each Trainee to serve as a liaison with the family. Each orientator should speak the local language and be experienced with the local culture. It is the responsibility of the orientator to establish a rapport with the family prior to the arrival of the Trainees and to facilitate communication and understanding between the Trainee and the family during the live-in.

Step 2: **Meeting the Families** (2 hours)

Transport Trainees to their assigned families. At the home of each family, have the orientator provide initial introductions and answer any questions which arise. Ask that each Trainee have lunch with the family, settle in and return to the training facility on their own.

Trainer Note

○ If possible, the orientator should stay for lunch on this first day. If this is not possible, each orientator should plan to have lunch with the family at least once during the live-in.

Step 3: **Initial Reactions and Observations** (30 minutes)

When the Trainees return, have them convene in a large classroom area. Begin by informally discussing the first encounter with the families. Stimulate discussion and sharing by asking how the Trainees felt when they arrived. Also determine what their general feelings are regarding the family and what they think the family is feeling about them. Distribute Handout 2A, "Behavior Contrast Study Guide", and explain it. Point out that the questions on the handout are provided to help guide and promote the development of observation skills. Ask the Trainees to look over the questions and to briefly discuss any behaviors which they think are different from, or similar to, behaviors to which they are accustomed. Explain that they should keep the handout for future reference during their live-in experience.

Step 4: **Cross-Cultural Adaptation Skills** (15 minutes)

Ask the Trainees to identify some of the specific skills that they will be developing and practicing during the live-in. Write the list on newsprint. Stimulate discussion and participation by suggesting such skills as:

- dealing with ambiguity
- recognizing and understanding non-verbal communication
- sharpening analytical observation techniques

Trainer Note

○ Be sure to save this list for future reference during Session 23, "Family Live-In Analysis".

Step 5: **Personal Goals** (15 minutes)

Ask each Trainee to develop a list of personal goals for the family live-in experience. Have them write down:

- what they want to accomplish and
- what they feel the families want to accomplish.

Collect what the Trainees have written and explain that these personal goals will be discussed in detail during the "Family Live-in Analysis" session.

Step 6: **Summary and Conclusion** (15 minutes)

Have a Trainee volunteer to review the objectives and describe how they were met. Stimulate discussion and encourage questions. Point out that during the live-in experience and throughout the program, Trainees will be encouraged to share their observations, concerns and feelings about this important aspect of the training program.

HANDOUT 2A

BEHAVIOR CONTRAST STUDY GUIDE

The following list constitutes some areas which you might want to examine in your daily interaction with your family during and after the live-in. Some of the issues will be considered directly during training, others can be discussed as they become relevant to you.

This is provided as a guide for you in considering cross-cultural differences and similarities between life in your host country and life in the United States.

1. Dress - how, in what roles, occasions?
2. Eating - how, with whom?
3. Joking - with whom, how; is laughter or giggling accepted: by men, women; when; what does it mean?
4. Respect - how, to whom; from whom; on what occasions? where?
5. Where to go and not to go; when?
6. Subjects to discuss - not to discuss.
7. Vocabulary - what is acceptable; where; when; with whom?
8. Eye contact - when is it permissible? required?
9. Physical proximity - what is allowed? accepted? required?
10. Physical stance or posture - what does it communicate? what is preferred?
11. Use of hands - how? what signals are given?
12. Physical contact - where, with whom, how?
13. Display of affection - how, when, with whom?
14. Display of emotion - anger, embarrassment, tears.
15. Taking precedence over others - who, when, why?
16. Punctuality - how late is late; social, business?

17. Honesty - personal, institutional?

18. Dependability - personal, institutional?

19. Blowing one's nose?

20. Taking off one's shoes - when, where?

21. Who associates with whom, where?

22. Sex - how seen by young, older generation; men, women, role in society?

23. Friendship - given by whom; when; intensity; responsibility; expectations; manifestations?

24. Hospitality - meaning; invitations to a home; introductions to the family; which members; when, how?

25. The good life - how is it defined; how achieved; by whom?

26. Privacy - when allowed, encouraged; reading or thinking, why discouraged, meaning of being alone.

27. Drinking - when, where, why, with whom; how much?

28. Work-leisure - attitudes toward, value of.

29. Age, childhood - attitudes toward, value toward; allowances for, respect for.

30. Discipline and authority - from whom to whom; when; for what reasons?

Please add others which you feel are important.

31.

32.

33.

34.

35.

36.

Handout 2B

FAMILY LIVE-IN ROLES

The Trainee's Responsibilities

- Respect the norms of your house regarding hours, manners, customs and respect.
- Use your orientator as a resource.
- Eat what the family eats without demanding special treatment; you are a member of the family, not a boarder.
- Practice what you have learned of the local language with your family.
- Use the family as a resource with respect to your learning about the culture.
- Share your points of view and opinions with the family.
- Attempt to resolve your own problems before sharing them with your orientator.
- Give a positive image of North Americans and Peace Corps.
- Maintain open lines of communication with your family and your orientator.
- Accompany your family, when you are invited.
- Integrate yourself into your family as much as possible.
- Be conscious of the amount of time you spend with your family, the culture and the language.

The Family's Responsibilities

- Treat your Trainee as if he or she were another member of your family:
    - serve him or her the same type of food that your family normally eats.
    - look out for his or her health and well-being.
- Help your Trainee improve his or her local language:
    - demonstrate patience and understanding.
    - correct them - don't let them speak like Tarzan.
    - dedicate (all members of the family) thirty minutes to an hour as a minimum per day to conversing with them.
    - help them to practice talks and demonstrations.
- Attend Training Center activities.
- Communicate with your Trainee and the orientator:
    - be sincere with them; communicate with them anytime you feel concerned.
    - expect your Trainee to respect the norms of your family regarding hours, manners, customs and respect.
- Include your Trainee in the everyday activities of your family.
- Be a source of information regarding the beliefs, customs and norms of your country.

Our goal is that you and your Trainee have a pleasant experience. We ask that you be families and not hosts, that you cooperate and collaborate and that you are not unduly inconvenienced.

The Orientator's Responsibilities

- Visit your house before the Trainee arrives.
- Review, with the family, the responsibilities and expectations of each of the three parties involved - the family, the orientator and the Trainee.
- Take the Trainee to the family and have lunch with them the first day or at some time during the training program.
- Get to know each other better by doing something planned together.
- Maintain open lines of communication with the Trainee throughout training; this should be founded on your interest in his or her well-being and progress in training.
- Make periodic visits to the family, aimed at helping your Trainee to adapt to the culture. Each visit must be followed by a conversation between you and your Trainee.
- Make a habit of speaking informally with your Trainee, as frequently as possible, making sure to speak with him or her prior to visiting the family.
- Maintain rapport by sharing your observations and comments, both positive and negative. Concerns should be shared, first with the Trainee to seek alternative solutions, and then only with the person in charge of the group, if solutions are not forthcoming.

SESSION 3

TRAINING SITE INVESTIGATION

TOTAL TIME 2 hours

OVERVIEW Throughout this first day, Trainees have been observing and acquiring information about the new environment of the training site and the surrounding community. This session provides Trainees with the opportunity to familiarize themselves with the basic facilities in and around the training site, while further practicing their observation and information gathering skills. Trainees work in groups to plan and implement a strategy for investigating the training site. They then share the results of this investigation with the entire group.

OBJECTIVES

- To plan and carry out an information-gathering strategy.
- To identify essential support facilities at the training site.
- To practice sharing information with others.
- To discuss the importance of observation and information-gathering skills in the role of a Peace Corps Volunteer.
- To summarize and briefly evaluate the results of the first day of training.

RESOURCES – A map of the training site.

MATERIALS markers, newsprint

PROCEDURES

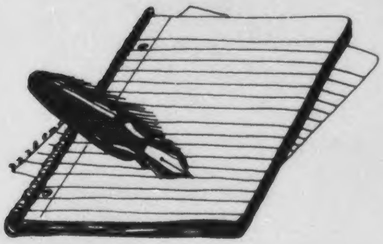
Trainer Note

○ Before the session, draw a large map of the training site and the immediate surrounding area, on newsprint (see Step 1). The map should be without any labels or names of places, other than cardinal directions. It should be large enough to be divided into three "sections" such that each section contains several important buildings, roads, facilities or landmarks.

Step 1: **Information-Gathering** (50 minutes)

Briefly explain the objectives and outline the procedures of the session. Post the map of the training site and divide the group into three "investigation teams". Assign each team a section of the training site map and have them:

- develop a list of information they wish to obtain in the investigation of their section;
- plan a strategy for gathering the desired information;
- carry out the information-gathering strategy; and
- prepare an effective way of presenting the information to the rest of the group.



Step 2: **Information Sharing and Presentations** (50 minutes)

Reconvene the group and have each team present the results of its information-gathering activity. Encourage questions from among all the Trainees as each group makes its presentation. Following the presentations, have the group discuss the role of observation skills and information-gathering in their future work as Peace Corps Volunteers. Mention that, later in the program, they will have the opportunity to design and implement an in-depth community analysis (see Session 34, "Preparation for Site Visit").

Trainer Note

○ In addition to providing practice in observation, information-gathering and information-sharing, this session is also designed to help Trainees familiarize themselves with the basic logistical support facilities at the training site and in the surrounding area. Be sure that, in the course of the presentations, adequate information is shared regarding such basics as:

- how mail is received and sent
- location and use of medical facilities
- available transportation
- location of classrooms.

Step 3: **Conclusion and Evaluation** (20 minutes)

Conclude the activity by asking the Trainees to reflect upon and describe what they have learned during this first day of training. Ask them to identify and discuss those activities which were particularly effective and those which were not so effective. Have them provide specific suggestions for improvement. Point out that, throughout the program, Trainees will be asked to evaluate sessions and to provide feedback regarding their design. Explain that feedback will be discussed in more detail during the up-coming "Expectations" session.

SESSION 4

DEFINING EXPECTATIONS

TOTAL TIME 3 hours

OVERVIEW Many expectations need to be considered in any training program. Trainees enter the program with their personal expectations and there are expectations on the part of the training staff, of the host country and of Peace Corps. It is important that everyone "buys into" the program and evaluates how it meets their particular needs. In this session, trainers and Trainees have the opportunity to clarify their expectations of one another and to make modifications as they are appropriate.

OBJECTIVES

- To identify and discuss the major themes of the program.
- To list and clarify Trainee and staff expectations of the program.
- To review and explain the program schedule.

RESOURCES

- copies of the manual introduction for all Trainees
- copies of the program schedule for all Trainees
- Appendix A, "Training Program Objectives"

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ The entire training staff should participate in this session in order to develop a list of their expectations of the program.

Step 1: **Training Themes** (30 minutes)

Explain the objectives of the session and briefly review the procedures. Have the Trainees brainstorm a list of what they consider to be the major themes of the program. Write the list on newsprint and discuss the meaning and significance of each theme.

Stimulate discussion and help to focus this list by suggesting a couple of the themes discussed in the introduction to the manual (e.g., technical skill building, nutrition, health and communication skills).

Step 2: **Defining Expectations** (50 minutes)

Have Trainees form small groups in which they discuss their expectations of the program. Each group should write on newsprint their five most important expectations. Point out that they will need to focus their expectations around the themes identified in Step 1. Explain that the training staff will meet as one group and develop a list of their expectations as well.

Step 3: **Sharing and Clarifying Expectations**
(1 hour, 10 minutes)

Reconvene the Trainees and have each group post its expectation list. Distribute copies of the training program schedule, the manual introduction and Appendix A, "Training Program Objectives". Explain that:

- the manual introduction presents an overview of the program and an orientation to its overall purpose
- the training schedule gives the Trainees a day-by-day description of the training and
- the program objectives represent a list of the minimal behavioral requirements necessary to successfully complete the program.

Point out that sessions are designed such that full and active participation will result in successful completion of all of the objectives. Encourage questions and discussion among the Trainees.

Review each of the posted expectation lists for clarity and understanding. Identify those expectations which the training will meet directly, those which will be touched upon, those which could be addressed with some schedule changes and those which may not be met, given the practical limitations of the program. In the course of reviewing the expectation list developed by the training staff, it is important to point out that throughout the program, Trainees will be expected to provide input regarding program design; and that progressively more and more responsibility for program design, content and delivery will be turned over to them.

Trainer Note

○ The training staff must be flexible enough to be ready to modify the program to meet the Trainees' reasonable expectations, if they are to avoid presenting the Trainees with a "take it or leave it" program.

○ In order to make the connection between expectations and how they will be addressed during the program, it is helpful to refer to specific sessions that will deal with the expectations listed by the group.

Step 4: **Summary and Conclusion** (30 minutes)

Conclude the session by facilitating a discussion centered around the following questions:

- Were any of your expectations changed by this activity?
- Was there something that you learned in this session that you were not expecting during training?
- Is there anything that you have heard about this program that has not been discussed?

Trainer Note

- ○ In addition to clarifying and defining the Trainees' understanding of the program, this final step helps them to express ways in which the program may not meet some of their needs.
- ○ Immediately following this session, select one of the Trainees who already has some experience working with bees as the Trainee to prepare and facilitate Session 7, "Bee Colony Cycle". Thoroughly brief the Trainee regarding the objectives and procedures of that session.

SESSION 5

ASSEMBLING PROTECTIVE CLOTHING

TOTAL TIME 6 hours

OVERVIEW Protective clothing is essential for a confident beekeeper. Adequate protection will vary according to personal preference, the type of bee, the time of year, the time of day and the condition of the hive. Well-made protective clothing allows the beekeeper to work effectively without worry. The veil protects the eyes and face from the bees; generally it is the single piece of equipment most often used by people working regularly with bees.

In this session, Trainees become familiar with the basic features of protective clothing. Furthermore, they have the opportunity to interact with a local tailor or seamstress in order to have a veil made.

OBJECTIVES

- To examine desirable attributes of protective clothing.
- To acquire a bee-proof veil and hat.
- To discuss difficulties associated with procuring hats, veils, gloves and bee-proof suits.
- To communicate and negotiate with local craftsfolk who sew protective clothing.
- To share experience and insights gained through interaction with the local community.

RESOURCES

- Small Scale Beekeeping, pp. 87-89, 202.
- ABC and XYZ of Bee Culture, pp. 644-645.
- The Hive and the Honey Bee, p. 322.

MATERIALS veil or screening material (dark color), muslin cloth, string, money, scissors, tape measures, elastic (or strips of tire tube), example of: veil, hat, gloves, bee-proof suit

PROCEDURES

Trainer Note

○ The first three steps occur the hour before lunch. Step 4 is scheduled so that the Trainees can leave for lunch and begin the process of getting the veils made.

Step 1: **Desirable Attributes of Protective Clothing** (30 minutes)

Ask one of the Trainees to assist in this activity by modeling various articles of protective clothing as they are described. Elicit suggestions from the Trainees as to what they desire for protective clothing. As the Trainees are describing the clothing, point out and have the model demonstrate various important features of appropriate clothing. Stress that comfort and dependability are the two most essential assets in selecting personal beekeeping apparel.

Step 2: **Assigning the Tasks** (15 minutes)

Explain to the Trainees that their task is to have a veil made locally by a tailor or seamstress to whatever specifications they desire. Also, point out that this is an opportunity to buy hats, if necessary.

Mention that this activity provides the opportunity for Trainees to explore the community surrounding the training site. Explain that in order to promote interaction with the new community, it is important that they have the veils made rather than sewing the veils themselves. If necessary, provide the Trainees with suggestions regarding how to locate a local seamstress or tailor by:

- questioning people in the market place,
- providing addresses of local craftsfolk.

Explain that, if the Trainees finish early, they should take advantage of the time to:

- check on honey availability and prices,
- determine other types of services available such as carpentry shops and hardware stores
- find out about the local transportation system
- investigate the foods available locally
- determine the availability of other beekeeping equipment and supplies.

Step 3: **Assembling Materials** (15 minutes)

Have the Trainees gather the plans or materials which they decide can best convey the desirable attributes for their veil. Be certain that each Trainee assembles enough materials to meet their needs.

Trainer Note

○ The materials for making the veils should be on hand and possibly divided into individual packets for the Trainees to take to the seamstress or tailor.

Step 4: **Locating a Seamstress or Tailor** (4 hours)

Have each Trainee locate a tailor or seamstress; specify what clothing is needed; negotiate a price; and pick up the finished product.

Trainer Note

○ The Trainees must have their required protective clothing, such as veils and hats, for use by the morning of the third day of training, when they will present them to the group (see Step 5).

Step 5: **Presentation of Veils and Discussion** (1 hour)

Ask each Trainee to demonstrate their veil to the group, explain how they conveyed the information and where a tailor or seamstress was located. As the Trainees describe getting their veils made, have them share any information they obtained about local beekeeping activities, available supplies and any other insights into the community.

SESSION 6

CONSTRUCTING KTBH'S AND PREPARING THE APIARY SITE

TOTAL TIME 9 hours

OVERVIEW The Kenya Top Bar Hive (KTBH) is an intermediate technology hive. As such, it is consistent with the Peace Corps' philosophy of Volunteers working as extension agents encouraging the use of local materials. In this session, each Trainee will construct their own KTBH for use in the training program. The Trainees will also prepare the apiary site for their hives. This session sets the stage for the Trainees taking charge of the technical aspect of their training program.

OBJECTIVES

- To discuss the principles of the KTBH.
- To acquire/practice carpentry skills.
- To construct an individual KTBH for the bee management sessions.
- To construct KTBH's using local materials. (Africa only).
- To prepare the apiary site.
- To construct a dip board for making starter strips.
- To work together in groups.

RESOURCES

- Small Scale Beekeeping, pp. 73-81, 189-191, 204.
- BeeKeeping Handbook
- The Beekeeper's Handbook

MATERIALS

hammers, saws and measuring tapes (one set per three Trainees)
wood chisels and paint brushes (one set per six Trainees)
wood, nails, thin sheet metal, wire/rope, a plane, paint, pencils, a KTBH, beeswax and starter strips, design plans for the KTBH and a dipboard, material for constructing benches in the apiary (concrete blocks, 2x4's or posts depending on what is available)

PROCEDURES

Step 1: **Introduction to the KTBH** (30 minutes)

Present a brief history of the KTBH emphasizing its "appropriateness" for many beekeeping development situations. Point out the specifics of the KTBH construction using a hive or photos to display the important factors. Include such factors as modifications which allow for hanging of the KTBH contrasted to placing on a hive stand; the proper angle formed by the walls and base; how to make the top bars; and short-side entrance versus long-side entrance.

Question the Trainees why it is important that the top bars be of the proper width and why the sides of the hive are inclined.

Discuss these two major principles of the KTBH and the various ideas as to the location of the entrance (short side vs. long side). Encourage Trainees to experiment with the different locations.

In some regions where Volunteers may be working, building KTBH's out of wood may be impractical. Ask Trainees to suggest alternative materials and to point out the advantages and disadvantages of each. Encourage Trainees who will be going to regions (mainly sub-Sahara Africa) where wood is an impractical material, to experiment in building KTBH's out of alternative materials. Depending upon availability and cost, other materials may include bamboo, mud and sticks, baked mud, cement or 55-gallon barrels. Have the Trainees build these hives in addition to their wooden hives during ensuing "Bee Management Technique" sessions.

Trainer Note

○ For a training period of six weeks, a nucleus-sized KTBH (1/2 regular length) is sufficient. It would be impossible for a bee colony to fill a full-sized KTBH in such a short period. Therefore, a small volume is desirable to demonstrate proper hive management techniques. However, there should be at least one full-sized KTBH available for the group to observe.

○ The differences in sizes between the different races of bees affects the top bar width. Resource materials can inform Trainees of the proper dimensions for the race of bee in their host country.

Step 2: **Constructing Individual KTBH's and a Dip Board**
(8 hours, 30 minutes)

Have each Trainee build an individual KTBH for use during the training program. Have one or two Trainees who have good carpentry skills make a dip board.

Move among the groups as they are building the hives and offer suggestions or give demonstrations on building techniques.

Trainer Note

○ Since top bars are time-consuming to make, it may be useful to have these made by a local cabinetmaker. Have grooves cut in most of the top bars, so that starter strips can be used on them; however, leave some top bars without grooves, so that the Trainees can experiment with a line of beeswax on the top bar. (If all the top bars are grooved, some can be inverted in order to experiment with a line of beeswax.)

○ The Trainees will be sharing tools in order to build their hives; thus, they will naturally break into groups. Encourage Trainees with good carpentry skills to team up with those who do not have such skills. This will facilitate the exchange of carpentry skills among the whole group.

○ There will probably be comments made about the lack of power tools. Take this opportunity to point out that Peace Corps Volunteers are often frustrated in their work by lack of equipment and support and that learning to use available resources is an integral part of being a successful Volunteer. Also point out that while there may be a few problems in constructing a KTBH with hand tools, the task of constructing a Langstroth hive with such tools would be relatively complex.

○ In order that the Trainees can have bees in their colonies before the end of the first week of training, a few starter strips should be available for them to use to start their colonies.

○ Making more starter strips should be a priority for an up coming "Bee Management Techniques" session since the starter strips will be needed as the colonies begin to grow. The equipment, other than the dip board, needed to make the strips can be assembled during this session by Trainees who have finished building their hives and have them sited in the apiary.

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○ As some of the Trainees begin to finish their hives, remind all the Trainees of the other tasks that need to be completed. Suggest that they paint their hives such that they allow enough time for them to dry. Those Trainees who finish early can help others who are slower.

○ The up-coming "Establishing Individual Nucs" session and ensuing "Bee Management Techniques" sessions can be used by those Trainees who need more time to finish constructing their hives.

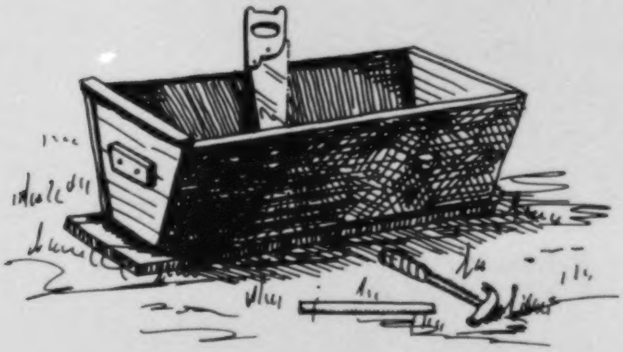
Step 3: **Preparing the Apiary Site** (concurrent with Step 2)

As some of the Trainees begin to finish their KTBH's, briefly orient them to the basic principles involved in preparing an apiary site. Have them begin preparing the site and have others join them as they finish with their hives.

As the Trainees are preparing the site, ask them to express their reasons for choosing the site and for orienting the hives in the way they did. Use this information to generalize about the characteristics of a good apiary site. Point out that a "perfect" site is rare and that a decision must be made by maximizing the desirable characteristics of a site. Discuss with the Trainees the methods available to improve an apiary site.

Trainer Note

○ Remind the Trainees to bring protective clothing for the up-coming "Establishing Individual Nucs" session.



SESSION 7

BEE COLONY CYCLE – INTRODUCTION TO TRAINEE FACILITATION

Trainer Note

○ This is the first of a series of Trainee-facilitated sessions. The transfer of skills and information is a primary task of a Peace Corps Volunteer. This series of sessions provides the Trainees an opportunity to further develop communication skills by independently designing and delivering a training activity. Trainees will conduct a session and receive feedback from their peers on the effectiveness of the design and delivery of the session. These Trainee-facilitated sessions encourage the individual to acquire and effectively present beekeeping information.

○ In addition to the objectives described in each session, this series of sessions is designed to enable the Trainees:

- To develop a list of effective training design criteria.
- To develop a list of effective facilitation skills criteria.

○ The session plans should be made available to the Trainees to help them in their preparation. However, encourage the Trainees to be innovative in both their session design and delivery.

○ Always be available as resources to help Trainees in preparing their sessions.

○ For this first session, give a copy of the session to the Trainee who will facilitate. When the Trainee has completed the presentation through Step 3, continue with Steps 4 to 7, using the Trainee's presentation as a basis for establishing the format for session evaluation.

TOTAL TIME 2 hours

OVERVIEW A good understanding of the bee colony cycle and the factors which affect it is essential for successful beekeeping. Overall hive management objectives during the cycle are the same wherever beekeeping is carried out. This session will discuss the bee colony cycle, the management objectives during each part of the cycle and the practices used to ascertain the colony cycle for an area. This will prepare the Trainees to adapt their beekeeping skills to any area where they may be working.

OBJECTIVES

- To discuss the bee colony cycle.
- To explain the effects of weather on the cycle.
- To examine management objectives and schemes for each part of the cycle.
- To discuss methods to ascertain colony growth, available bee plant resources, and the impact of weather patterns on the colony.

RESOURCES

- Small Scale Beekeeping, Chapter 4.
- The Hive and the Honey Bee, Chapters 11, 12, 16.
- Beekeeping in Zambia
- Attachment 7A, "The Essence of Beekeeping"

MATERIALS

blackboard, chalk, newsprint, markers, graph paper, monthly temperature and rainfall charts of areas where the Trainees will be working

PROCEDURES

Trainer Note

○ The attached article, "The Essence of Beekeeping", provides a basic outline for this session.

Step 1: **Introduction** (5 minutes)

Introduce the session with the idea that the activity in the colony changes throughout the year and, that as a result, management objectives change. Explain that the beekeeping cycle is basically the same everywhere beekeeping is carried out.

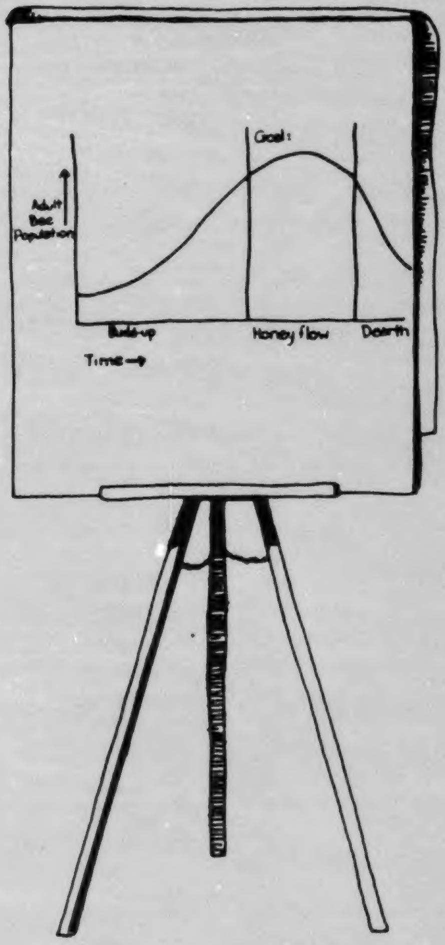
Step 2: **Graphing the Cycle** (30 minutes)

Draw on the Trainees' observations and experiences to reproduce the population graph of the cycle. Introduce terminology for the bee cycle in the languages which the Trainees will be using as Volunteers. Note that the bee cycle is influenced primarily by rainfall patterns in the tropics, while in temperate regions and in the subtropics, temperature patterns influence the cycle. Relate this to the flowering (nectar-producing) characteristics of plants in these regions.

Provide each Trainee with graph paper and make available, on newsprint, monthly temperature and rainfall data for the area where the Trainees will be working. Have the Trainees graph the data by months and then predict the bee colony cycle on the graph. Relate their predictions of the yearly growth and decline of the colony population to weather patterns in the areas where they will be working.

Step 3: **Management Objectives and Schemes** (30 minutes)

Discuss the overall management objectives for each portion of the cycle and examine the management practices used to meet these objectives. Point out that good beekeeping involves understanding the bee colony cycle and carrying out management operations at the right time.



Step 4: **Introduction to Session Evaluation** (15 minutes)

Explain the difference between session design and facilitation. Briefly discuss the importance of good training design and facilitation skills in the role of a Peace Corps Volunteer.

Explain the format of the evaluation process for session design and facilitation skills. Point out that there will be a series of Trainee-facilitated sessions during the training program. At the end of each of these sessions, time will be set aside to evaluate the design of the session and the facilitation skills used by the Trainee. As these evaluations occur, an on-going list of session design components and facilitation skills will be developed. These lists will be posted permanently in the classroom and will be referred to and amplified throughout the program.

Step 5: **Evaluation of Session Design** (15 minutes)

Ask the Trainee who facilitated the session to evaluate the design of the session, then ask the remainder of the group for their evaluation. Have a Trainee begin a list, on newsprint, of the components of good session design. Guide the evaluation process with the following questions:

- What generalizations can be drawn regarding the design of this session?
- What was good about it?
- What were some points where it could have been improved?
- How might this session be designed differently for working with agency level personnel or with small-scale farmers?

Step 6: **Evaluation of Facilitation Skills** (15 minutes)

Ask the Trainee who conducted the session to evaluate the facilitation of the session, then ask the remainder of the group for their evaluation. Have a Trainee begin a list, on newsprint, of facilitation skills. Guide the evaluation process with the following questions:

- What did the facilitator do to help the session go smoothly?

- What behaviors of either the facilitator or participants were particularly effective in facilitating learning? Which were not so effective?
- Would these same behaviors be effective when working with host country farmers, or agency-level personnel?

Step 7: **Identifying Trainee Facilitators** (10 minutes)

Post, on newsprint, the following list of Trainee-facilitated sessions and the dates they are to occur:

Session 11	Functional Biology of the Honey Bee
Session 16	Types of Bees and the Bee-Human Relationship
Session 17	Foraging
Session 20	The Bee Space and Types of Hives
Session 21	Obtaining Bees
Session 26	Swarming, Supersedure and Absconding
Session 28	Constructing a Swarm Board and Swarms
Session 30	Extractors and Solar Wax Melters
Session 33	Melliferous Plants
Session 36	Honey
Session 37	Other Hive Products
Session 46	Bee Diseases and Pests
Session 47	Insecticides and Bees

Briefly explain the content of each of these sessions and explain that the approach used in these sessions should be directed toward agency-level personnel.

Ask Trainees to volunteer to facilitate the listed sessions and ask for a different Trainee to volunteer to conduct the evaluation of each session. Suggest that the same Trainee may want to facilitate Session 26, "Swarming, Supersedure and Absconding" and Session 28, "Constructing a Swarm Board and Swarms". Also suggest that a Trainee with good building skills facilitate Session 30, "Extractors and Solar Wax Melters", point out the Session 21, "Obtaining Bees", can be facilitated effectively by two people (see Trainer Note, Session 21), and suggest that Session 33, "Melliferous Plants" be done by a Trainee with an interest in botany.

List the names of the facilitators and evaluators on the newsprint and leave it posted in the classroom. Point out that less time should be needed for evaluation during ensuing Trainee-facilitated sessions as the evaluation and feedback skills of the group improve.

Trainer Note

- Fifteen minutes are scheduled at the end of each Trainee-facilitated session. This should be sufficient to evaluate the session using the format described in Steps 5 and 6.

Beekeeping techniques

The essence of beekeeping

by S. C. Jay

The information presented here in note form is based on material used in introductory lectures at the University of Manitoba, Canada, during the past fifteen years. It is hoped that it will be of use to beekeeping instructors elsewhere, and perhaps to beekeepers in general.

A. Definition of beekeeping

Beekeeping means managing honeybee colonies in such a way as to: (*a*) obtain a large (or maximum) adult colony population to coincide with the major honey (nectar) flows in the area, and (*b*) utilize this population to the beekeeper's greatest advantage for storing honey and or pollinating crops.

B. Problems

Three basic problems face beekeepers world-wide (see Fig. 1):

1. they must determine when their ***main*** honey flows occur;
2. they must build up colony populations in preparation for these main flows;
3. they must decide what to do with colonies during the post-flow periods.

In parts of the temperate regions where bees are kept commercially on a large scale, there is usually only one main honey flow, which involves a sequence of plant sources and lasts for a few weeks. In tropical and subtropical regions the main honey flow may follow a heavy rainy period, lesser flows following periods of lighter rain. It is for the main flow that a beekeeper must primarily prepare his colony populations, often beginning 6-8 weeks beforehand.

From: Bee World, Vol. 60, No. 3, 1979.
pp. 140-142.

The more predictable the main flow, the easier it is for the beekeeper to prepare large colony populations at the right time for it. It seems to be much more difficult to predict the timing of main flows in tropical regions than in temperate regions with a continental climate—for many reasons. Only too often, in all parts of the world, colony populations are built up *on* the main flow, instead of achieving the peak population during the main flow, when it can produce maximum honey crops.

C. Some solutions to the above problems

1. To determine when the honey flows occur in a given area:
    - (*a*) Make surveys to identify the major nectar and pollen yielding plants within flight range of the bees, and which of these plants the bees visit, especially in large numbers.
    - (*b*) Make surveys to record the flowering periods of these plants.
    - (*c*) Make seasonal records of the weight of test colonies kept on scales.
    - (*d*) Study farming practices in areas within flight range of the bees.
    - (*e*) Examine weather records, soil data, altitude variations.

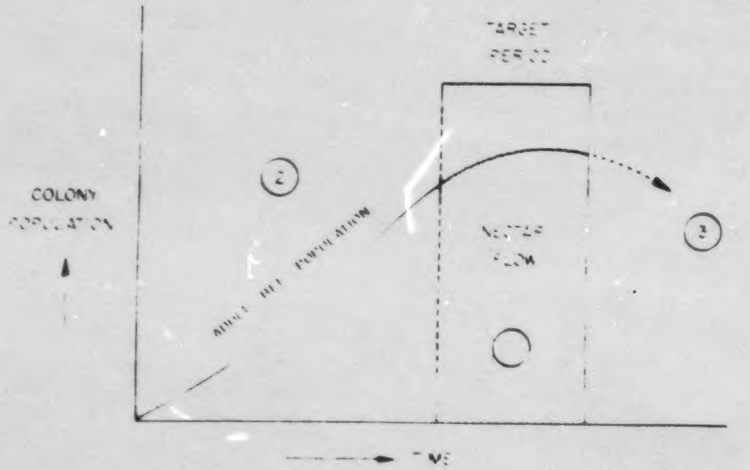


FIG. 1. Most effective relationship between colony build-up and main honey (nectar) flow. Numbers indicate the problems listed under B, with suggested solutions under C.

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2. To build up colony populations in preparation for the main flow(s), give the following careful attention:
    - (*a*) Queenrightness and queen performance of each colony.
    - (*b*) Apiary sites.
    - (*c*) Arrangement of colonies within apiaries.
    - (*d*) Care of overwintered colonies in spring, and/or care and introduction of packages of bees.
    - (*e*) Feeding—methods and types of food.
    - (*f*) Control of diseases and pests.
    - (*g*) Swarm prevention.
    - (*h*) Provision of adequate hive space for brood and for nectar.

3. To decide between the following alternatives after the flow period:
    - (*a*) Ignore colonies after the nectar flow.
    - (*b*) Use surplus bees to increase the number of colonies.
    - (*c*) Kill off colonies.
    - (*d*) Use bees to build combs for future use.

    In temperate regions:
    - (*e*) Reduce the numbers of bees in colonies for wintering.
    - (*f*) Winter the colonies where they are, or move tham to another outdoor site, or indoors.

    In the tropics:
    - (*g*) Maintain colonies at reduced populations.

D. Where beekeeping is most successful

Beekeeping appears to be most successful today in parts of the world where:

1. Large areas of bee forage are available at specific predictable times of year.
2. Good flying weather prevails during the honey flows.
3. Movable frames are used in hives.
4. The three problems above are recognized and dealt with:
    - (*a*) Determining when flows occur
    - (*b*) Preparing colonies for flows
    - (*c*) Post-flow care of colonies.

E. Final word for commercial beekeepers

One of the main objects of the commercial beekeeper in managing his hives is, as quickly as possible, to reach the stage where he can start to manage an entire apiary as a single unit, not as a group of individual colonies. He will then be in a position where each hive in an apiary will be ready to receive the same treatment at the same time (feeding, supering, drug control, queen check, etc.). This is impossible as long as there are substantial population variations or imbalances within an apiary: whether because some queens are poor; because bees drift after packages are hived or after hives are moved out of winter quarters (or in established apiaries); because of diseases or pests; or because food stores are inadequate.

ADULT LEARNING AND AN INTRODUCTION TO METHOD DEMONSTRATIONS – BASIC INSECT ANATOMY

TOTAL TIME 4 hours

OVERVIEW It is important to provide Trainees with an introduction to the basic methodology and approach to learning used in this program. By examining and comparing two, distinct approaches to learning about "Basic Insect Anatomy", Trainees are introduced to the principles of adult learning and to the experiential learning model. They are then asked to use these principles in working as a group to plan a strategy and to develop criteria for the evaluation of their up coming method demonstrations.

OBJECTIVES

- To identify the basic body parts of insects.
- To discuss how bees and other insects adapt to the environment.
- To examine and identify the characteristics of the approach to learning used in this program.
- To list characteristics of adult learners.
- To identify ways to use adult learning principles and the experiential learning model as a Peace Corps Volunteer.
- To discuss the value of method demonstrations in the role of a Peace Corps Volunteer.
- To plan and develop criteria for evaluation of an effective method demonstration.
- To select topics for the first method demonstrations.

RESOURCES

- A Trainer's Guide to Andragogy, Its Concepts, Experience and Application, pp. 1-10.
- A Handbook of Structured Experiences for Human Relations Training, pp. 3-8 (reference guide).
- Any basic entomology text
- Handout 8A, "The Experiential Model"
- Handout 8B, "Participative and Directive Training Styles"
- Handout 8C, "Method Demonstration Guidelines"

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ Prior to this session, two technical trainers should prepare two methodologically distinct session designs relating to "Basic Insect Anatomy". Both designs should have the same objectives. One trainer should prepare a "traditional lecture-type" presentation. The other trainer should design an experiential session which uses adult learning principles and guides Trainees through the four phases of the experiential learning model as described in Handout 8A.

Step 1: **Basic Insect Anatomy** (1 hour)

Review the session objectives and explain the procedures. Ask the Trainees to divide into two groups. Have the technical trainers carry out the "Basic Insect Anatomy" activity as described in the preceeding trainer note.

Step 2: **Information Sharing** (25 minutes)

Briefly reconvene the group and have the Trainees divide into pairs with someone from each of the two "Insect Anatomy" groups in each pair. Explain that, in their groups of two, Trainees should:

- share content information about what they have learned about insect anatomy;
- describe to one another the design of the activity; and
- evaluate the delivery techniques used by the trainer.

When the pairs have finished, have them report back and share the results of their discussions. Encourage discussion and sharing of information by asking:

- What new information did you learn from one another about insect anatomy?
- What was good or not so good about the design of the activity for each group?
- What was good or not so good about the facilitation techniques used by each trainer?
- Which of the two styles seemed most effective? Why?

Step 3: **Experiential Learning Model** (15 minutes)

Distribute, explain and discuss Handout 8A, "The Experiential Model". Ask Trainees to identify the similarities and/or differences between the experiential learning model and the insect anatomy activity in which they were involved. Answer any questions which may arise.

Trainer Note

○ It may be helpful to sketch the experiential learning loop on newsprint for use during this discussion.

Step 4: **Adult Learning Principles** (15 minutes)

Ask the Trainees to brainstorm a list of general conclusions which can be drawn about how adults learn best. Have them develop this list of conclusions based on their analysis of the two styles used in the "Insect Anatomy" activity. Help to stimulate responses by reminding the Trainees of some of the conclusions about session design which they identified and discussed following the first Trainee-facilitated session (Session 7, "Bee Colony Cycle").

Write their responses on newsprint. Help to focus the discussion by suggesting and explaining the basic adult learning principles discussed in A Trainer's Guide to Andragogy, pp. 1-10.

Step 5: **Training Styles** (15 minutes)

Distribute Handout 8B, "Participative and Directive Training Styles" and ask the Trainees to identify ways in which they might use the principles of adult and participatory learning in their work as Peace Corps Volunteers.

Step 6: **Method Demonstrations** (20 minutes)

Point out that one important way in which Peace Corps Volunteers can incorporate adult learning techniques into their work is through method demonstrations. Explain that during the program Trainees will be expected to do three method demonstrations. Each demonstration should be designed so as to be directed toward third world, village-level audiences. Encourage and stimulate discussion among the Trainees regarding how and why method demonstrations are of value to Peace Corps Volunteers. Point out the dates and times of the up coming method demonstrations as they appear on the program schedule. Mention that, within the structure of other sessions, additional opportunities will be provided to practice method demonstration skills. Cite the presentations described in Session 24, "Queen Rearing", as an example. Answer any questions which the Trainee may have.

Trainer Note

○ In the six-week schedule, method demonstrations are scheduled to occur at two-week intervals throughout the program. The final demonstration occurs during the Bee Fair, in the sixth week of the program (see Session 39, "Introduction to the Bee Fair").

○ Each method demonstration should be designed to last approximately fifteen minutes and to be followed by about fifteen minutes of feedback and evaluation. During the periods allotted for each of the first two demonstrations, the Trainees should be divided so that at least one trainer can be with a group of no more than eight Trainees.

Step 7: **Demonstration Evaluation Criteria** (1 hour)

Distribute Handout 8C, "Method Demonstration Guidelines". Allow reading time and briefly answer any questions. Have the Trainees appoint a facilitator and, based on the information provided in the handout, develop a list of criteria to be used to evaluate each method demonstration. Provide focus and assistance in this activity by explaining that, after each method demonstration, the procuedure will be similar to the evaluation procedure used following each of the Trainee-facilitated sessions.

Trainer Note

- ○ In addition to developing the criteria, another objective of this step is to provide Trainees with an opportunity to work independently. It is, therefore, important to allow them maximum freedom to develop the criteria according to their own style as a group.
- ○ Once the criteria have been developed and written, they should be typed and copied, so that they can be distributed to all Trainees as a guide prior to the first method demonstration.

Step 8: **Method Demonstration Topics** (15 minutes)

Ask the Trainees to decide on the topics that they want for their first method demonstration. List their names and the topics on newsprint. Explain that they can decide on the topics for the second and third demonstrations later.

Trainer Note

- ○ Since the topics for the method demonstrations should relate directly to beekeeping, Trainees should seek suggestions and input from the technical trainers prior to selecting topics.

Step 9: **Summary and Conclusion** (15 minutes)

Ask the Trainees to reflect upon the design of this session and to discuss how it relates to the experiential learning model and adult learning principles. Have the Trainees identify the steps of this session which correspond to the "experiencing", "processing", "generalizing" and "applying" phases of the experiential model. Explain that adult learning principles will be used throughout the program. Stimulate discussion by asking them to identify other sessions and/or activities which have used experiential and adult learning principles.

HANDOUT 8A

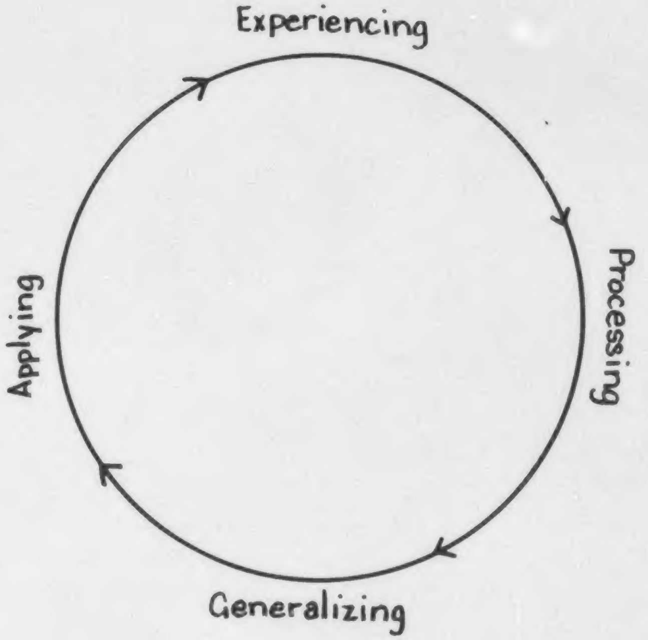
THE EXPERIENTIAL MODEL

The experiential model is based on a cyclical learning process of four separate but interlocking procedures. As implied by the name of the model, the emphasis is on the direct experiences of the participant or learner, as opposed to vicarious experiences garnered through didactic approaches.

The experiential model is also an inductive rather than a deductive process: the participants discover for themselves the learnings offered by the experiential process. This discovery may be facilitated by a leader, but in the end the participants find and validate their own experiences.

This is the "laboratory" -- or experiential -- approach to learning. It is based on the premise that experience precedes learning and that the learning, or meaning, to be derived from any experience, comes from the learners themselves. Any individual's experience is unique; no one can say what he or she is to learn, or gain from any activity. Probable learnings can, of course, be devised, but it is up to the participants to validate these for themselves.

Four revolving steps are included in the experiential model:



EXPERIENCING

The process usually starts with experiencing. The participant becomes involved in an activity, acting or behaving in some way or doing, performing, observing, seeing, or saying something. This initial experience is the basis for the entire process.

PROCESSING

Following the experience itself, it becomes important for the participant to share or "process" his or her reactions and observations with others who have either experienced or observed the same activity. An essential part of the cycle is the necessary integration of this sharing. The dynamics that emerged in the activity are explored, discussed and evaluated (processed) with other participants.

GENERALIZING

Flowing logically from the processing step is the need to develop principles, or extract generalizations, from the experience. Stating learnings in this way can help participants further define, clarify and elaborate them.

APPLYING

The final step in the cycle is to plan applications of the principles derived from the experience. The experiential process is not complete until a new learning or discovery is used and tested behaviorally. This is the "experimental" part of the experiential model. Applying, of course, becomes an experience in itself, and, with new experience, the cycle begins again.

From: A Handbook of Structured Experiences for Human Relations Training, Reference Guide (Revised), Pfeiffer, William J. and Jones, John E., University Associates Publishers and Consultants, San Diego, California, 1981, pp. 3-8.

HANDOUT 8B

PARTICIPATIVE AND DIRECTIVE TRAINING STYLES

	The Participative Trainer		The Directive Trainer
1.	Involves the Trainee in creation or revision of program objectives and/or the identification of individual learning needs and objectives; strives to keep objectives related to where Trainee is and wants to go.	1.	Defines objectives for Trainee achievement at the beginning of the program; holds to these throughout to maintain consistency and coherence.
2.	Assists Trainees in identifying possible learning activities and in effectively structuring such activities.	2.	Decides what learning activities are most appropriate and expects Trainees to follow this structure.
3.	Expects the Trainee to learn by exploring and discovering, asking questions, making use of available resources and solving problems.	3.	Expects the Trainee to learn primarily by absorbing material through lectures, and readings, by memorizing or practicing and by responding to trainer questions.
4.	Involves the Trainees in decision-making; invites ideas, suggestions and criticism from the Trainees.	4.	Makes the decisions or carries decisions made by the staff; does not invite suggestions or criticism from the Trainees.
5.	Structures the training so that unplanned and unexpected problems will be treated as learning opportunities.	5.	Follows the schedule closely; avoids problems or dispenses with them quickly, so they will not interfere with the planned sequence or schedule.
6.	Promotes cooperative work among Trainees and a climate of openess, trust and concern for others.	6.	Promotes individual learning effort, accountability and competition among Trainees.

7. Promotes self-assessment by Trainees and provides feedback of information needed by Trainees to evaluate their own progress.	7. Personally assesses Trainee performance and progress, usually through formal tests.
8. Involves the Trainees in mid-course or final evaluation of training program, processes, materials and its progress toward objectives and elicits suggestions.	8. Does own mid-course or final evaluation of training program and its effectiveness; draws own conclusions about needed revisions.

HANDOUT 8C

METHOD DEMONSTRATION GUIDELINES

Types of Demonstrations: A strict method demo focuses on showing beekeepers how to carry out an improved practice along with a verbal explanation of the benefits. A result demo is designed to promote interest and acceptance of a new practice or "package" of practices by showing the actual results (benefits). The most effective demos are usually method-result demos that combine the what, why, when and how of an improved practice with physical proof of the benefits.

Who should give a demo?: Whenever possible, demos should be conducted by locally experienced extension workers fluent in the language or by "contact" beekeepers. However, beekeeping Peace Corps Volunteers often unavoidably find themselves in this role.

The guidelines below are designed primarily for method and method-result demos.

PREPARING YOURSELF

1. Make sure the topic is timely and relevant in terms of beekeeper needs (i.e., don't hold a method demo on how to harvest honey when the harvesting season is over). If the session involves a large number of beekeepers, limit the presentation to a topic that can be adequately covered in 10-15 minutes or you're very likely to lose the audience's attention. Cover a limited area thoroughly rather than picking a broad topic that would confine you to less useful generalities.

2. Thoroughly research the topic and prepare yourself for questions, many of them skeptical or dealing with specific costs and expected yields.

3. Master all the needed hands-on skills so you can perform them smoothly.

4. Practice the demo, preferably in front of some of your beekeeper friends; get their feedback on your language and credibility and the audience comprehension. If you have great difficulty with the language, you may want to use an interpreter.

GIVING THE DEMO

1. Establish rapport with the audience before starting the actual demo; mill around informally and chat for a few minutes. Wear a name tag (if people can read). Consider having refreshments.

2. Begin the demo by introducing yourself and explaining your job role.

3. After introducing yourself, immediately state the subject of your demo and its relevance for the audience. Remember, this is real-life vocational education, not a university lecture hall. Aside from language and technical difficulties, this is the most common weak point among Peace Corps Volunteers.

   In the absence of physical proof of the practice's benefits, you'll have to "hook" your audience verbally with an attention grabbing "come on", but one that avoids exaggeration of false claims.

4. Use a "hands-on" approach: Like you, beekeepers learn best experientially rather than having someone talk "at" them. Whenever possible, involve the audience and let them practice what they're being shown.

5. Use a well organized, step-by-step method of presentation and always include a summary at the end of the demo.

6. Use vocabulary, phrasing and comparisons that will maximize comprehension: If you're less than fluent in the language, speak extra slowly and check periodically for comprehension. Remember, technical words aren't likely to be understood if translated directly. It's better to describe melliferous plants as "bee plants". When in doubt, simplify.

SESSION 9

COMMUNICATION AND LISTENING SKILLS

TOTAL TIME 2 hours

OVERVIEW It is important that Peace Corps Volunteers communicate effectively, both among themselves for mutual support and with host country individuals. In addition to techniques related to transferring technical information, effective communication involves such basic interpersonal skills as listening actively, providing feedback and helping others to solve problems. This session creates a structured framework in which Trainees practice these skills within a cross-cultural context. While working on their communication and listening skills, the Trainees will identify and resolve problems which may have evolved while in groups or during their family live-in experience.

OBJECTIVES

- To practice active listening.
- To practice giving and receiving feedback.
- To practice problem-solving and helping skills.
- To discuss and begin to resolve problematic aspects of the family live-in and/or of the effective working styles of the group.
- To identify and describe ways in which basic communication skills vary in cross-cultural situations.
- To set a climate for constructive feedback and active listening in the training program.

RESOURCES

- A Trainer's Guide to Andragogy, pp. 164-174.
- Non-Verbal Communication
- The Silent Language
- Handout 9A, "Feedback and the Helping Relationship"
- Handout 9B, "Johari Window"

MATERIALS newsprint and markers

PROCEDURES

Step 1: **Feedback** (30 minutes)

Facilitate a brief discussion of the training program to date. Ask for impressions of the overall program, or ask about any difficulties Trainees have experienced in the new environment of the training program. Distribute Handout 9A, "Feedback and the Helping Relationship" and review it with the group, highlighting different aspects of giving and receiving feedback. Explain that:

- Effective communication underlies all mutually supportive relationships -- in personal life, in the work environment and in formal as well as informal counseling situations. However, it takes practice to develop the skills necessary to have helpful, non-threatening interactions.
- Perhaps the most important aspect of counseling is to be a good listener: that is, one who listens actively, knows how to interview unobtrusively and can provide accurate feedback to the person being interviewed.
- Interpersonal communication involves complex dynamics on both the verbal and non-verbal levels. If there is distortion in either sending or receiving the intended message, then misunderstanding and a breakdown in communications will result.
- Feedback serves to clarify communication so that the helping relationship is enhanced through accurate perceptions of the concerns and problems being discussed.

Distribute Handout 9B, "Johari Window" and review it with the Trainees. Explain that the Johari Window model is instrumental in providing a framework for continuing exercises in giving and receiving feedback. The model is helpful in keeping the "feedback" theme in perspective and in encouraging the use of feedback as a constructive technique for building awareness, trust, communication and problem-solving skills.

Step 2: **Listening/Feedback/Problem-Solving Demonstration** (30 minutes)

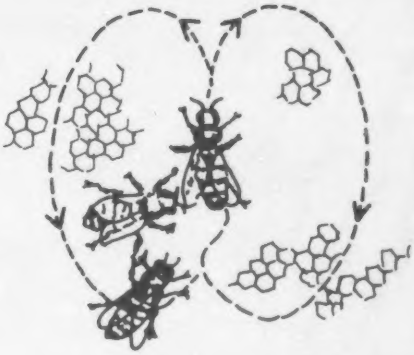
Present a brief demonstration of how feedback and listening can be used to improve communication and to solve problems. Ask two Trainees to volunteer to demonstrate the following exercise in front of the group:

- One person speaks briefly (approximately 30 seconds) about some problematic aspect of the family live-in.
- The other person listens as carefully as possible, then paraphrases what has been said and associates with it a "feeling" which was

describe any problems which were resolved as a result of the activity.

Step 4: **Summary and Conclusions** (20 minutes)

Ask the Trainees to identify and discuss ways in which active listening and feedback skills will be of value during their service as Peace Corps Volunteers. Point out that the intent and effect of certain verbal and non-verbal forms of communication often varies from one culture to another. Ask them to cite examples of different/similar forms of communication that they have noted with their families and/or around the training site. Have them suggest ways in which listening and providing feedback will be different in their assigned countries as Peace Corps Volunteers. Conclude by explaining that Trainees will be encouraged to practice basic interpersonal communication skills throughout the program.



HANDOUT 9A

Feedback and the Helping Relationship*

Some criteria for useful feedback:

1. It is descriptive rather than evaluative. By describing one's own reaction, it leaves the individual free to use it or not to use it as he or she sees fit. By avoiding evaluative language, it reduces the need for the individual to react defensively.

2. It is specific rather than general. To be told that one is "dominating" will probably not be as useful as to be told that "just now when we were discussing the issue, you didn't listen to what others said and I felt forced to accept your arguments or face an attack from you."

3. It takes into account the needs of both the receiver and the giver of feedback. Feedback can be destructive when it serves only your own needs and fails to consider the needs of the person on the receiving end.

4. It is directed toward behavior which the receiver can do something about. Frustration is only increased when a person is reminded of some shortcoming over which he or she has no control.

5. It is solicitied, rather than imposed. Feedback is most useful when the receiver himself or herself has formulated the kind of question which those observing him or her can answer.

6. It is well-timed. In general, feedback is most useful at the earliest opportunity after the given behavior (depending, of course, on the person's readiness to hear it and on support available from others).

7. It is checked to insure clear communication. One way of doing this is to have the receiver try to rephrase the feedback he or she has received to see if it corresponds to what the sender had in mind.

8. When feedback is given in a group, both giver and receiver should have an opportunity to check with others in the group the accuracy of the feedback. Is this one person's impression or an impression shared by others?

Feedback, then, is a way of giving help; it is a corrective mechanism for the individual who wants to learn how well his or her behavior matches the intention and it is a means for establishing one's identity -- for answering "who am I?"

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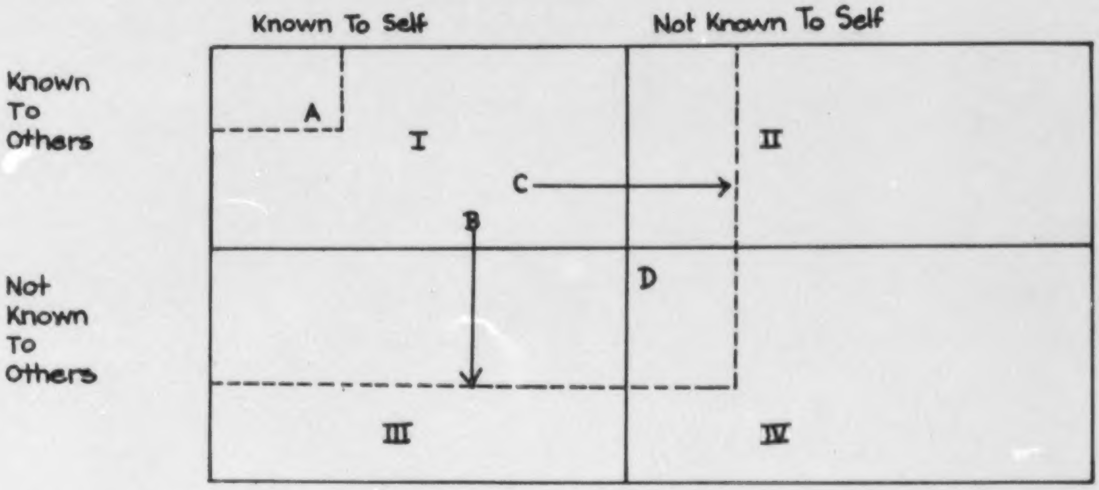
* Taken from NTL's Reading Book: Laboratories in Human Relations Training, Arlington, Va., National Training Laboratories, 1969.

HANDOUT 9B

Johari Window



Description of Areas:

Area I: Information about self known to self and known to others. The area of free activity and interaction. "Public or Shared Self".

Area II: Information about self not known to self and known to others. The Blind Area -- sometimes called the "Bad Breath Area".

Area III: Information about self known to self and not known to others. Avoided or Hidden Area. The "Private or Secret Self".

Area IV: Information about self not known to self and not known to others. The area of Unknown Activity. The "Area of Hidden Potential".

Most people enter a new environment with a very small Area I (A). There is very little shared information and very little interaction can take place.

As a person becomes more comfortable, he or she shares some information and expands towards Area III (B).

If a person is open for feedback to occur, he or she expands towards Area II (C).

The result of these two activities is that totally new information and potential in Area IV (D) is discovered. These new learnings are directly attributable to interaction in the new environment.

NOTE: Having an expanding or expandable Area I increases your area of interaction and tends to facilitate the entering of a new environment.

Johari refers to the originators, Joe Luft and Harry Ingham.

SESSION 10

ESTABLISHING INDIVIDUAL NUCS

TOTAL TIME 4 hours

OVERVIEW A personal hive for each Trainee is an important aspect of the training program. Once the hive is established, the Trainee will maintain it and keep records on it throughout the training program. This session will give the Trainees experience in establishing a hive by dividing a colony. The Trainees will plan the task and then implement what has been planned. For some, this will provide the first hands-on experience working with bees. Once established, the personal hive will allow the Trainees to work independently on their beekeeping skills and to demonstrate these skills to others in the training community.

OBJECTIVES

- To light a smoker properly.
- To discuss the desirable attributes of smoker fuels.
- To make a hive division.
- To establish an individual hive.
- To practice cutting out and transferring queen cells.
- To begin keeping records on the hives.

RESOURCES

- The Beekeeper's Handbook
- Small Scale Beekeeping, pp. 118-120.

MATERIALS individual KTBH's, ripe queen cells, pocket knife, notebooks, pens, various smoker fuels, matches, smoker, water sprayer

PROCEDURES

Step 1: **Introduction** (30 minutes)

Before starting work in the apiary, ask the Trainees to share their conceptions of the tasks of making a hive division and establishing a nuc. If any Trainees have experience, ask them to explain these processes to the group. Remind the Trainees that as they will be working with strong colonies, they should wear proper protective clothing.

Step 2: **Smoker Fuels and Lighting a Smoker** (25 minutes)

Have available some examples of various materials used for smoker fuel. Discuss what smoker fuels may be available in the areas where the Trainees will be working. Ask some of the Trainees to light the smokers. Have other Trainees describe what is happening and elicit suggestions from them as to how to more effectively light the smoker. Point out the purpose of using smoke and describe the desirable qualities of a good smoker fuel.

Emphasize the following points:

- Have a good fire in the bottom of the smoker before packing it with fuel.
- Use fuel which produces a cool, white smoke. Suggest putting green plant material on the top of the fuel to accomplish this.
- Pump the bellows periodically when working in the apiary so that the smoker remains lit.
- Use a water sprayer to control highly defensive bees.

Step 3: **Demonstrating a Hive Division** (35 minutes)

Have a Trainee demonstrate the cutting out and transferring of queen cells, attaching comb to top bars and shaking bees into a hive. Stress the importance of observing carefully and asking questions during this demonstration.

Trainer Note

○ Since this will be the Trainees first independent work in the apiary, it is important for them to understand fully what they are doing in order to reduce confusion. As many of them will be working with strong colonies for the first time during this session, some may receive multiple stings and become frustrated and/or exasperated.

Step 4: **Establishing Individual Hives** (2 hours, 30 minutes)

Have the Trainees establish their individual nucs and start records on their activities.

Trainer Note

○ The trainer should be available in the apiary to answer questions and to offer suggestions - but not to directly help in the bee work. It is important that Trainees feel that the nucs are theirs.

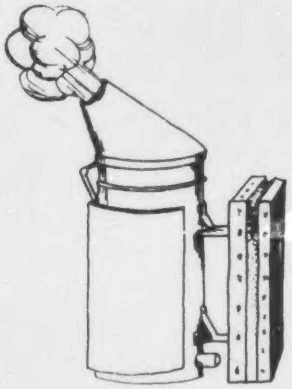
○ Have at least two ripe queen cells for each Trainee.

○ Remind the Trainees that record keeping is important and that they should start maintaining records on their hive. Emphasize that they should record information when it is observed -- not later, when it may be forgotten or confused. Encourage them to develop their individual styles of record keeping so that it will be of the most benefit to them.

○ Periodically, encourage the Trainees to share their recorded information so as to improve upon their own style of record keeping.

○ If more time is needed by some Trainees, they can complete establishing their nucs during the first "Bee Management Techniques" session.

○ Once the Trainees have established their nucs with ripe queen cells, it is best to wait a couple of days before disturbing the colony.



SESSION 11

FUNCTIONAL BIOLOGY OF THE HONEY BEE

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW Good beekeeping requires that the beekeeper know bees, their needs and how to supply the requirements of the colony. The beekeeper who understands bee biology is better able to ensure that appropriate management techniques are carried out. This session provides the Trainees with background biology on honey bees and gives them the opportunity to observe the various life stages of bees.

OBJECTIVES

- To discuss the castes, anatomy and life cycle of bees.
- To discuss the role of each caste in the colony.
- To list the resource needs of the colony.
- To examine the life cycle stages of honey bees.

RESOURCES

- Small Scale Beekeeping, Chapter 3.
- The Social Organization of Honeybees
- The Hive and the Honey Bee
- Contemporary Queen Rearing, p. 19.

MATERIALS blackboard, chalk, samples of different castes of bees, observation hive with bees, nucleus with bees, schematic drawing of honey bee (see p. 81, The Hive and the Honey Bee), hand lens, personal protective clothing, smoker, fuel, matches

PROCEDURES

Step 1: **Anatomy of the Honey Bee** (15 minutes)

Pass around samples of various honey bees and hand lenses. Point out and describe the basic features of the anatomy of the honey bee on a large schematic drawing while the Trainees examine the samples. Focus on those structures which are

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useful to bees in their role as pollen and nectar gatherers. Introduce vocabulary terms from the language in which the Trainees will be working. Encourage discussion and answer questions.

Step 2: **The Castes and the Honey Bee Life Cycle** (35 minutes)

Give a brief lecture on the castes and the honey bee life cycle. Describe the three castes found in honey bees. Emphasize the characteristics which distinguish one caste from another.

Explain the specific functional duties and relate those duties to the anatomical structures of each caste. Include in the discussion the temporal change of tasks in workers. Outline the life cycle of the queen, worker and drone. Emphasize the role of nutrition in determining the formation of queens and the different developmental times for each caste.

Step 3: **Resource Needs of the Colony** (20 minutes)

Question the Trainees as to the resource needs of a bee colony and list these. Point out that the specific resource needs of the colony change during different periods of the yearly cycle and relate the availability of resources to management. Explain that the beekeeper can supply specific nutritional needs during certain periods to increase the productivity of the colony.

Step 4: **Demonstration/Review** (35 minutes)

Use a colony of bees to demonstrate and review the topics discussed. Use a colony that demonstrates a normal, healthy condition and stress the importance of recognizing such a condition in a colony so that one quickly becomes able to spot a diseased condition. Provide the Trainees with an opportunity to distinguish between drone and worker brood and between eggs and young larvae. Point out the royal jelly surrounding all larvae less than two days old. Also point out callow adult bees or tenerals.

Step 5: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Sesson 7, "Bee Colony Cycle".

SESSION 12

INTRODUCTION TO ASSESSMENT AND SELECTION

TOTAL TIME 2 hours, 30 minutes

OVERVIEW Trainee assessment is an on-going aspect of the training program. As a minimal requirement for successful completion of the program, each Trainee is evaluated on the basis of the degree to which objectives have been met. Additionally, and throughout the training, Trainees complete written "Self-Assessment Forms" which contain criteria for assessment that have been mutually agreed upon by both Trainees and staff. Trainers also complete similar assessment forms and the results are discussed and compared at two-week intervals during counterpart sessions. This process culminates in a final, mutually negotiated decision and resultant recommendation regarding the Trainee's potential for effective Peace Corps service. In this session, Trainees work in groups with the training staff to define, develop and negotiate the criteria which will serve as the basis for conducting the assessment process. The session also provides trainers with guidelines regarding how to implement the assessment process in the context of a six-week program.

OBJECTIVES

- To examine and clarify the way in which Trainees are assessed during the program.
- To list and define criteria which will serve as the basis for assessing the readiness and suitability of Trainees for future Peace Corps service.

RESOURCES

- Handout 12A, "Explanatory Notes on the Assessment and Selection Process"
- Handout 12B, "(Sample) Assessment Form"

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ It is important that all staff members participate in this session so that decisions concerning the assessment are mutually understood and accepted by both staff and Trainees from the start of the program.

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○ Note that this session is designed to provide the information and procedures necessary to implement all aspects of the Trainee assessment process. The activities involved in this process represent a combined total of 14 hours of scheduled training time as indicated on the Six-Week Schedule.

Step 1: **Orientation to Assessment/Selection** (40 minutes)

Briefly review the session objectives. Explain that throughout the program each Trainee will be evaluated based on the knowledge, skills, behavior and attitudes that will be important during Peace Corps service. The essence of this assessment system is that all who take part -- staff and Trainees alike -- share the process of defining and using criteria for effective Peace Corps work. Point out that a significant portion of the assessment process will focus on self-assessment on the part of the Trainee. Distribute Handout 12A, "Explanatory Notes on the Assessment and Selection Process". Allow reading time. Encourage Trainees to ask questions and to clear up any doubts which may exist.

Step 2: **Developing Assessment Criteria** (50 minutes)

Explain that in this step, Trainees work in groups to develop the criteria which will be used as the basis for the assessment process. Distribute Handout 12B, "(Sample) Assessment Form". Explain that the criteria in each of the four categories have been developed during previous training programs and are intended as samples that may be used as guidelines to help develop criteria for use in this program.

Have the participants form four groups (one for each major evaluation category: communication, commitment, technical and cognitive) and develop, on newsprint, a list and explanation of the criteria which they believe are important as a basis for assessment in that particular category.

Trainer Note

○ Each group should include representatives from both staff and Trainees in order to insure that there is active involvement by all who are participating in the training program.

○ Whether the criteria from the sample form are used, modified or changed, there should be ample time allotted for discussion so that the group may arrive at an agreement about the criteria to be used. It is possible that the group will accept the sample evaluation criteria and all that will be necessary is a review and definition of the terms already listed.

Step 3: Presentation and Acceptance of Criteria

(1 hour)

Reconvene the Trainees and have a representative from each group post and explain their criteria list. Make any necessary modifications, additions or deletions such that the entire group agrees upon all criteria. Explain that the final criteria lists developed in this session will be used by the staff in writing their assessments of each Trainee and that the Trainees will use these criteria in writing their self-assessments prior to each counterpart session.

Trainer Note

○ The criteria lists should be typed according to the format shown in Handout 12B. The same assessment form should be used by both Trainees and trainers, with only the title changed. Those assessment forms which will be completed by the Trainees should be entitled, "Self-Assessment Forms" and those which will be completed by the training staff should be called "Trainer Assessment Forms".

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○ It is important to consistently carry out all aspects of the assessment process throughout the program. The following brief outline of the major aspects of the process is provided as a reference guide:

Week One
- Define expectations of the program.
- Introduce the assessment process.
- Present and explain the Training Program Objectives.
- Define and list the Trainee Assessment Criteria.
- Develop, type and copy the Self- and Trainer Assessment Forms.

Weeks Two and Four
- Staff completes a written "Trainer Assessment Form" for each Trainee.
- Each Trainee completes a written "Self-Assessment Form".
- Conduct the counterpart session.

Week Six
- Introduce and explain the final assessment process.
- Staff completes a cumulative, written "Trainer Assessment Form" for each Trainee.
- Each Trainee completes a cumulative, written "Self-Assessment Form".
- Conduct the final counterpart session.
- Negotiate and have Trainees sign the Final Recommendation.

HANDOUT 12A

Explanatory Notes on the Assessment and Selection Process

The essence of this program is to help you develop the skills and knowledge that will be necessary during Peace Corps service. For this reason we emphasize the importance of on-going assessment. Such assessment is essential for making any recommendation about your readiness and suitability for Peace Corps service.

Remember: you are not yet a Peace Corps Volunteer and it is your participation in this program that will help you and the training staff determine whether or not Peace Corps is the right direction for you at this time. We encourage you to take an active role in the process: from identifying the criteria that will be used to assess you, to taking part in the evaluation of your knowledge, skills, attitudes and characteristics that are relevant to future Peace Corps service.

The assessment process includes a number of steps and is intended to provide tools for examining your growth and readiness. The decision to leave the program can be made at any point during training, either by you or by the training staff. Any decision of this kind should be mutual and based on an honest, open self-appraisal.

The format and implementation plan of this assessment and selection process consists of the following:

A. **Training Program Objectives**

1. Purpose
   To provide you with a written statement of the minimal behavioral requirements necessary to successfully complete the program.

2. Implementation
   To be distributed and discussed during the "Expectations" exercise in the first week of the program.

B. **Training Expectation List**

1. Purpose
   To enable you to clarify your expectations regarding the training program and to enable the training staff to clarify their expectations.

2. Implementation
   To be developed in a structured activity during the first week of the program.

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C. **Trainee Assessment Criteria**

1. Purpose
   To provide you and the training staff with a basis for assessing your ability to acquire the skills necessary for successful Peace Corps service.

2. Implementation
   To be developed and mutually negotiated by you and the staff during a structured activity in the first week of the program (see Session 12, "Introduction to Assessment and Selection").

D. **Self-Assessment Forms**

1. Purpose
   To provide you with a format for writing a self-assessment based on the criteria developed in the previous exercise.

2. Implementation
   To be completed by you every two weeks and prior to each counterpart session.

E. **Trainer Assessment Forms**

1. Purpose
   To provide the training staff with a format for writing an assessment of your progress based on the criteria developed in Session 12, "Introduction to Assessment and Selection".

2. Implementation
   To be completed by the training staff every two weeks prior to each counterpart session.

F. **Counterpart Sessions**

1. Purpose
   To provide you and the training staff with the opportunity to share perceptions of your progress regarding levels of skills acquisition and to discuss strengths and weaknesses in a mutually supportive and constructive environment.

2. Implementation
   To be conducted every two weeks during the program on a one-to-one Trainee/staff basis, with completed "Self-Assessment Forms" and "Trainer Assessment Forms" serving as a basis for discussion.

G. Final Counterpart Session

1. Purpose
Based on the culmination of all completed evaluation techniques and indicators, to provide you and the training staff the opportunity to discuss your overall readiness and suitability for Peace Corps service and to arrive at a final, mutually-negotiated decision regarding your invitation for Peace Corps service.

2. Implementation
To be conducted during the final week of training.

H. Final Written Recommendation

1. Purpose
To provide you, the training staff and Peace Corps with a final written statement of your level of skills development and an overall recommendation regarding your invitation to continue training or to enter Peace Corps service.

2. Implementation
To be negotiated mutually and signed during the final counterpart session.

HANDOUT 12B

(Sample) Assessment Form

NAME: ______________________________

Skill Area	Observations: Be as specific as possible in your comments
Commitment to Program: - Participates actively and fully. - Establishes good working rapport with fellow Trainees and staff. - Is self motivated for learning and doing. - Is willing to share and receive appropriate feedback. - Demonstrates an eagerness to experience cross-cultural aspects of the program.	
Communication Skills: - Listens actively: pays attention, follows topics, encourages participation. - Articulates: expresses self effectively, addresses audience. - Feedback: maintains open lines of communication. - Transfers technical components and language into layman's terms. - Explores different levels of communication: non-verbal, physical appearance, verbal and cultural.	

(Sample) Assessment Form

NAME: ______________________________

Skill Area	Observations: Be as specific as possible in your comments
Cognition Skills: - Is aware of personal strengths and weaknesses. - Is adaptable within the cultural context. - Makes best application of personal strengths. - Recognizes and solves problems (both individual and group). - Recognizes alternative views of values: e.g. hygiene, work ethic, view of reality. - Is open to personal development. - Has an ability to make rational decisions and accept outcomes. - Plans effectively. - Is innovative and creative.	
Technical Skills - Demonstrates competency: applies principles, understands principles, demonstrates competency to others (Trainees, staff and community). - Is innovative: makes use of available resources. - Demonstrates the potential to continue personal beekeeping education and learn related skills.	

INTRODUCTION TO PROGRAM EVALUATION

TOTAL TIME 1 hour, 30 minutes

OVERVIEW A system of on-going evaluation is important to any training program in order to insure that improvements are made and that the special needs and perspectives of the training group are taken into account. Program evaluation activities enable Trainees to develop a sense of ownership for the program and to practice their skills at analyzing approaches to training. This session introduces evaluation as a component of the program. Trainees are asked to reflect upon and to evaluate the effectiveness of the first week of the program. A climate of receptiveness to feedback is established and a structure for future evaluation activities is introduced.

OBJECTIVES

- To evaluate the effectiveness of the first week of the program.
- To suggest ways in which the program might be improved.
- To practice giving and receiving feedback.
- To establish open communication among Trainees and the training staff.

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ One of the Trainees may be asked to facilitate this session. This is a good opportunity to encourage active participation and to demonstrate staff willingness to "let go" and be receptive to feedback. If a Trainee is to facilitate, brief that Trainee on how to handle the fishbowl exercise while the rest of the participants are working in the small groups (see Step 1).

Step 1: **Effectiveness of the Program** (30 minutes)

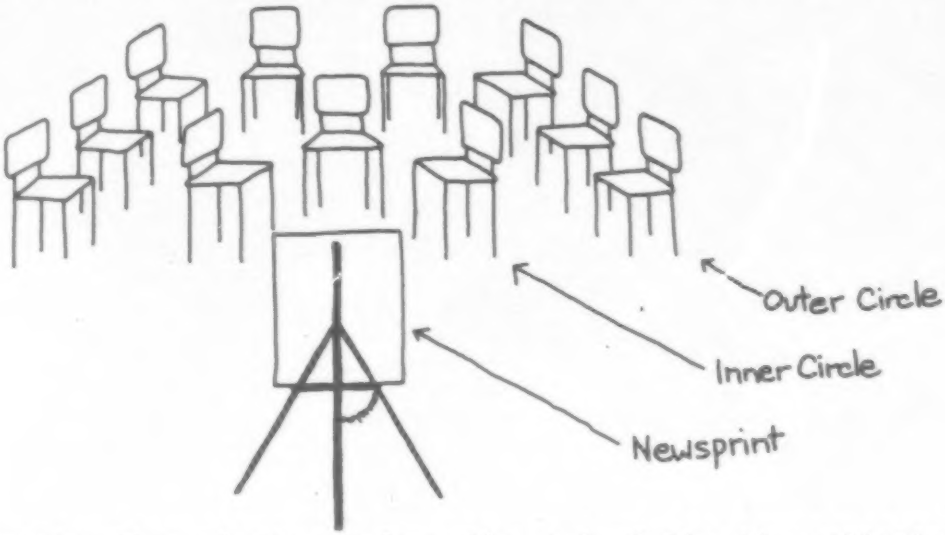
Review the session objectives and briefly explain the procedures. Explain that on-going program evaluation, through feedback from Trainees, can serve as a basis for continually improving the program.

Have the Trainees divide into groups of four or five. Ask that each group list, on newsprint, three aspects of the program which have been particularly effective and three aspects which have been particularly ineffective. For each ineffective aspect, ask that Trainees suggest ways in which it might be improved. Encourage the Trainees to be as specific as possible and to consider all aspects of the program.

Trainer Note

○ It is important that the training staff participate in this activity. Each small group should include at least one staff member.

○ While the small groups are working, arrange chairs in a semi-circle at the front of the room so that three people can face and speak to one another while reading the posted observations and suggestions. Arrange a second row of chairs around the first three. The configuration should look like this:



○ Approximately five minutes before the end of the time allotted for this step, circulate among the groups, remind them of the time remaining and ask that they post their observations and suggestions when they are finished.

Step 2: **Fishbowl Discussion** (45 minutes)

Have the group reconvene and occupy the chairs in the outer semi-circle. Explain the "fishbowl" activity. (Ask if anyone has had experience with this activity. If so, have them help with the explanation.) The explanation should include the following points:

- Only three people at a time will be in the inner semi-circle.
- The role of each of the three people will be to discuss and respond to the posted observations and examine the feasibility of the suggestions.
- When someone from the outer circle wants to enter the discussion, a person from the discussion group should leave and join the observers.

Explain that the reason for using the fishbowl structure is to provide a comfortable format for discussion and to encourage constructive feedback and suggestions.

Before beginning the discussion, have one of the Trainees scan the lists and point out common themes or parallels among the observations. Ask that three volunteers move to the inner semi-circle. Initiate the activity by responding to one of the posted observations.

Trainer Note

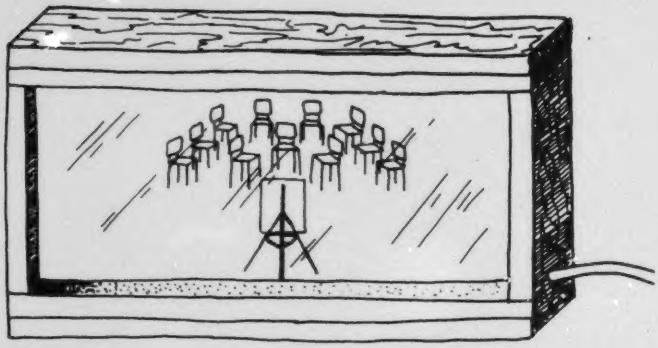
○ It is important that people feel free to express their thoughts without fear of reprisal. People should be encouraged to enter the discussion and to exchange places with one another when they have something to say. It is a good idea to have at least one member of the training staff in the discussion group at all times.

Step 3: **Summary and Conclusions** (15 minutes)

Summarize the observations and suggestions for improvement which have resulted from the fishbowl discussion. Stress those observations which seem most generally agreed upon by the group and most feasible in terms of future implementation. Explain that the fishbowl format may be used again at any time during the training; whenever participants feel it is necessary to discuss issues, clear the air or evaluate some aspect of the program.

Trainer Note

○ The process of Trainee evaluation of the program consists of a series of integrated activities which occur throughout the training. This session describes the evaluation activities recommended for Week 1. Other program evaluation activities are outlined in Week 3, Session 32, "Mid-Program Evaluation" and Week 6, Session 52, "Final Program Evaluation".



SESSION 14

BEE MANAGEMENT TECHNIQUES

TOTAL TIME 37 hours

OVERVIEW Beekeeping is both an art and a skill. As such, the only way to become a beekeeper is to practice the craft. This series of sessions provides the Trainees with experience in working their own individual hives while being guided by experienced beekeepers. Trainees will gain confidence in their own observational and beekeeping skills as they have a chance to practice them independently. They will gain new skills as they respond to the changing conditions in their hives. Furthermore, as the Trainees will be working together in the apiary, these sessions will provide an opportunity for them to practice their information transfer skills.

OBJECTIVES

- To work bees individually.
- To respond to the on-going situations in a bee colony and in the apiary.
- To establish an arena for peer learning of beekeeping skills.
- To practice various bee management techniques.
- To gain confidence in working with bees.

RESOURCES

- Small Scale Beekeeping
- The Beekeeper's Handbook
- The Hive and the Honey Bee
- ABC and XYZ of Bee Culture

MATERIALS smokers, smoker fuel, hive tools, protective clothing, individual hives, other materials (depending upon the situation that arises)

PROCEDURES

Step 1: **Work in the Apiary** (variable times)

Have the Trainees work on their individual hives or projects.

Trainer Note

○ These sessions form the backbone of the beekeeping training. They provide the opportunity to respond to many different beekeeping situations as they actually occur. Since all Trainees have their own hive, a sense of personal pride and ownership will evolve while working with the hive and maintaining the colony. As many hives are being managed, a wide range of beekeeping problems and situations will arise. This gives the Trainees both an opportunity to observe and respond to the situation as well as to practice their extension skills with other Trainees.

○ Be available to the Trainees during these sessions and guide them in their observations and working techniques. As the training program progresses, the Trainees should need less guidance.

○ While many of the topics covered in these sessions will be treated in other sessions, cover topics as they arise in the apiary. Respond to the situation. Never pass up a chance to teach about an aspect of beekeeping when the opportunity presents itself.

○ Point out bee disease and pest situations whenever they are encountered. Trainees should see as many of these situations as possible. Mail a laboratory sample for disease verification early in the training program so that the results will return before the program ends.

○ In addition to those management techniques covered in specific sessions, practice the following techniques during these sessions:

- diagnosing the brood pattern (condition of queen, disease, pests)
- adding brood comb to the brood nest to alleviate a honeybound condition and stimulate brood production
- preventing and stopping robbing
- switching colonies to equalize population
- feeding bees
- providing water for bees
- removing old combs
- combining colonies
- caging queens
- extracting honey
- mailing disease samples

Step 1: **Field Trip** (variable times) (alternative)

Take a field trip to observe the bee management techniques of local beekeepers.

Guide the Trainees in making observations on the social, economic and cultural milieu of small-scale beekeepers. Facilitate observations of those factors that, in general, limit agricultural development and those which specifically impede beekeeping development.

Trainer Note

- Observing local beekeepers and their techniques provides an opportunity for the Trainee to gain both technical and cross-cultural skills. Field experience will give Trainees a perspective by which to better adapt their beekeeping knowledge to their future work situation.
- A field trip to observe a beekeeper extracting honey during the early part of the training program is a valuable experience for those Trainees who have no beekeeping experience. As harvesting honey is the beekeeper's reward, seeing this activity provides direction to beginning beekeepers.
- The scheduling and content of field trips is dependent upon the convenience of local beekeepers. As such, they may occur at variable times during the training period.

SESSION 15

BASIC NUTRITION

TOTAL TIME 2 hours

OVERVIEW

Health and nutrition are essential aspects of the life of all Peace Corps Volunteers. All Volunteers must learn to adapt their personal eating habits to the host country environment, while maintaining an adequate nutritional level. In many cases, they are seen as role models of "good" nutrition practices. This session introduces the themes of health and nutrition as components of the program. It provides Trainees with an orientation to the concepts of basic nutrition. It encourages reflection about personal beliefs regarding food and eating behaviors. Trainees learn to recognize and assess the nutritive value of foods common in their sites as Volunteers. Local beliefs about foods are assessed and, where appropriate, strategies for modifying local diets are developed.

OBJECTIVES

- To discuss and clarify concepts of basic nutrition.
- To assess the nutritive value of local foods.
- To list ways to determine the nutritive value of unfamiliar foods.
- To examine and evaluate local beliefs about food.
- To discuss strategies for modifying local diets.

RESOURCES

- Where There Is No Doctor, pp. 107-130.
- Nutrition For Developing Countries, Chapters 1 and 2.
- The Personal Health Training Manual, pp. 107-133.
- Transcultural Study Guide, pp. 130-132.
- The Nutrition Factor, pp. 50-88.
- Handout 15A, "Basic Food Groups"

MATERIALS newsprint and markers, a variety of local food items

PROCEDURES

Trainer Note

○ Prior to beginning this session, purchase and/or gather samples of a variety of local food items. Set food items up in the form of a display in the classroom (see Step 1). Select food items that represent examples of:

- common local staples that the Trainees are receiving from their host families
- common staples of the countries to which they will be assigned as Volunteers
- common fruits and vegetables
- any potentially new and unfamiliar items and
- common types of honey or honey products.

○ If these foods are available close to the training site, an option is to have the Trainees purchase or gather them.

Step 1: **Nutritive Value of Foods** (30 minutes)

Briefly review and explain the major aspects of the health and nutrition component of the program. Cite examples of how the nutrition and health themes will be appearing in sessions throughout the program. Present the objectives and outline the procedures of this session. Point out a display of local foods and have the Trainees examine each of the food items. Ask them to identify those items which they recognize and to discuss what they know about how the item is prepared and eaten by the individuals in the community.

Distribute Handout 15A, "Basic Food Groups" and have the Trainees read it. Answer questions and invite comments related to the reading. Facilitate a discussion centered around the following questions:

- What are nutrients?
- What are important functions of the major nutrients?
- What important vitamins and minerals are found in foods?

Have the Trainees describe the nutritive value of each of the foods in the display and classify them according to basic food groups. Discuss the characteristics and uses of each food. Focus the discussion on those foods which will be the common staples in the countries where the Trainees will be working as Volunteers. In discussing the honey products in the display, be sure to stress the idea of honey as a cash crop item.

Step 2: **Unfamiliar Foods/Balanced Diets** (20 minutes)

Have the Trainees suggest different ways to combine the foods in the display to create meals which meet nutritional requirements. Write their responses on newsprint. Ask them to brainstorm a list of questions to be asked when investigating a new or unfamiliar food item. Write the questions on newsprint as they come up. Help to stimulate responses by suggesting such questions as:

- When and how is this food used?
- Is it a staple?
- Is it eaten at all meals?
- How is it prepared?
- Is it always available?
- Do people on all economic levels eat this food?
- Do all members of a family eat this food?

Recommend that the Trainees copy the list of questions and the balanced meal combinations for future reference once they are in their sites as Volunteers.

Step 3: **Innovations in Diets** (50 minutes)

Briefly point out how perceptions regarding food vary from culture to culture and that there are often variations within a particular culture. Ask the Trainees to briefly cite a few examples of beliefs about food and well-being which they either still hold as valuable or now perceive as superstitious. Provide a couple of examples, such as: "feed a cold, starve a fever" and "don't swim after eating".

Have the Trainees divide into three groups. Based on their experience to date with their host families, have each group identify and write on newsprint three local beliefs about food which they consider "correct" or "valuable" and three which they consider to be "superstitious" or "quaint". For each belief listed, have the groups describe how they would reinforce those which they consider positive and attempt to modify those which they would consider negative. Discuss whether or not it is necessary to modify beliefs which are harmless.

Allow the groups approximately 15 minutes to prepare the lists. Have them report back and ask a representative from each group to present and explain their list. Following each presentation, invite comments and discussion from among the Trainees. As a basis for this discussion ask such questions as:

- What role does tradition and habit play in determining tastes?
- Why is it that diet is one of the most difficult aspects of a culture to change?
- What dangers exist in suggesting changes in the diet which require the importation of new and/or hybrid seeds?
- How does economic status affect beliefs about foods?

Step 4: **Analyzing Existing Diets** (20 minutes)

Conclude the session by asking the Trainees to discuss ways in which they might wish to modify the meals which they are receiving from their host families. Discuss whether or not they are satisfied with the meals. Ask if the meals are balanced and/or repetitious. In appropriate cases, have them share any ideas regarding effective, culturally sensitive ways to improve the meals.

HANDOUT 15A

BASIC FOOD GROUPS

It is easiest to talk about the nutrients in food if we divide them into groups. The most common grouping uses three basic groups: (1) carbohydrates and fats; (2) proteins; and (3) vitamins and minerals. The body has different needs for these nutrients in health depending upon size, sex, age, degree of activity and climate.

1. Carbohydrates and Fats.

The group of nutrients known as carbohydrates consists principally of starches, sugars and various indigestible substances, such as cellulose. They are the body's main source of energy and heat. An excessive intake of carbohydrates means that the body is receiving a surplus of calories.

Most foods, including meat, fish and milk contain carbohydrates. However, they are mostly found in certain classes of vegetable foods, especially cereals (grains) such as wheat, rice, corn (maize) and the millets; roots crops such as potatoes, yams, cassava and members of the banana-plantain family.

Naturally occuring sugars, such as those found in milk (lactose), fruits (fructose) or honey (glucose and fructose) are also sources of carbohydrates, as are the cane sugars (sucrose).

In developing countries, carbohydrates are usually the main source of calories in the diet.

Fats may be derived from either plant or animal sources. They are concentrated sources of energy, having more than twice the calorie content of carbohydrates. Animal fats are present in the liver and fatty parts of animals and fish, the yolks of eggs and in milk fat and its by-products, such as butter and cream. Certain animal fats including egg yolks, liver and butter also contain the fat soluble vitamins A and D.

Vegetable fats are found in the groundnut (peanut), the soybean, the olive, the oil palm fruit, all nuts and the seeds of various plants, including sesame, mustard and cotton. In most developing regions, fats are costly and not widely available.

2. Proteins.

Proteins may be derived from animal or vegetable sources. Animal proteins are found in meats, fish (including shellfish), eggs, milk (and some of its products, especially cheese, yogurt and buttermilk) and to a minor extent from other sources, such as insects and snails. Foods of animal origin are not only rich, concentrated sources of protein, but also contain the complete range of the eight essential amino acids.

While almost all vegetable foods contain some quantity of protein, the content varies considerably. The richest in protein which usually contain about 20 percent, are the legumes -- the various beans, peas, lentils and the peanut (groundnut). Of these, the best protein source is the soybean (up to 40%).

The next best plant sources of protein are the cereal grains. While there is great variation among different types of cereals and many different strains exist as a group they contain about 10% protein.

Plant sources of protein which are often overlooked are dark, green, leafy vegetables, including tropical equivalents of spinach. These leaves contain about 2-10% protein. They are also good sources of other nutrients, including iron, vitamin C and riboflavin, especially the young leaves. Unfortunately, in many communities of the world, they are often not used as much as they might be and indeed often may be regarded as "poor man's food" with little prestige.

The staple foods poorest in protein are the various root crops, tubers and plantains, which have a protein content of only 1-2%.

As important as the total protein content of vegetable foods is the fact that their proteins do not contain the full range of the eight essential amino acids. For example, the protein of cereal grains, such as corn (maize) is deficient in the essential amino acid, lysine; while the proteins found in legumes, such as the soybean and chick-pea, are relatively low in another, methionine. The value of each of these foods is enhanced if eaten as cereal-legume mixtures, thereby providing the whole range of essential amino acids.

Diets in tropical countries are almost universally deficient in protein, (especially those of animal origin), a fact which is illustrated by a comparison of the average milk, other animal and vegetable protein intake in Latin American countries with figures from Canada and the United States. The rapidly rising populations in developing countries and the slow increase in agricultural production is tending to widen this "protein gap" still further.

In addition, all over the world, protein foods, especially those of animal origin, are more expensive than largely carbohydrate staples. In view of this, the need to use vegetable protein mixtures, if possible, with small additional quantities of animal protein, is an important principle of village-level infant feeding. Indeed, many traditional diets in different parts of the world appear to have evolved toward largely vegetable protein mixtures. These are often of a cereal-legume combination, in which the amino acid deficiency of one food is complemented by that of the other ingredient.

The basic function of proteins are to build and repair body cells, which are constantly being broken down and rebuilt and to form body enzymes. As proteins are needed for growth, there is a particularly high protein need in infancy and early childhood, when growth is especially rapid.

3. Vitamins and Minerals

The group of nutrients known collectively as vitamins are unrelated chemically, but are all essential in small quantities for the maintenance of good health. Severe deficiency, leading to the depletion of body stores, results in various forms of clinical malnutrition, which can sometimes be recognized by the appearance of certain signs or by the use of appropriate laboratory tests.

Vitamin deficiencies of various types occur in many parts of the world, especially if a diet is eaten which is limited to a restricted number of foods. In some communities of the world, the basic diet may consist of a very limited range of foods. This limitation may be because of economic reasons, because of local customs, because the terrain only permits the growing of limited crops, or because of a combination of all these reasons.

As with other forms of malnutrition, vitamin deficiency disease is much more likely to occur in the two nutritionally "vulnerable" groups -- young children and pregnant or lactating women. Their need for nutrients is high and their intake is often restricted by various harmful food customs.

Vitamin A can be taken in directly as vitaman A, which is contained only in animal foods, particularly in liver, egg yolk, milk and its products, and liver oil from the cod, halibut, shark and other fish. Alternately, vitamin A may be synthesized within the body from orange pigment foods. Rich sources of carotene include such orange-colored fruits and vegetables as the pawpaw (papaya), oil palm fruit, carrots, pumpkins, mangoes, yellow sweet potatoes and so forth, as well as dark green leafy vegetables including various tropical equivalents of spinach and cassava leaves.

Vitamin A is principally required for the normal functioning of the skin and eyes, including the retina. In some parts of the world, vitamin A deficiency is a most common and serious form of malnutrition. It is both preventable and tragic in its consequences, as it may easily lead to permanent blindness.

The three main members of the vitamin B complex or group are thiamine, riboflavin and niacin.

Thiamine, which is required for the metabolism of carbohydrates in the body is widely available in a variety of tropical foods, including cereal grains, legumes, green leafy vegetables, fish, milk and meat. Thiamine is water soluable and easily absorbed. It breaks down at high temperatures.

Lack of riboflavin produces ulcers at the corners of the lips and a generally red, sore mouth.

Niacin is found distributed in numerous foods. Rich animal sources include meat, particluarly liver, while the best available sources in tropical countries are legumes, including groundnuts, and cereal grains, especially if they are undermilled and still contain the germ.

Corn (maize) is a particularly poor source of niacin, especially if the germ has been removed by overmilling. Clinical malnutrition due to niacin deficiency is thus principally a disease of corn-eating communities. In the Mayan cultures of Central America, a particularly valuable method of preparing corn has been employed for centuries. In this method, corn is initially treated for some time with lime before being cooked as tortillas. This has the advantage of enriching the grain with calcium and improving the amino acid value and available niacin.

Ascorbic acid (vitamin C) is found in vegetables, especially green leaves and various fruits, particularly those of the citrus group. There are often especially rich local sources of ascorbic acid, such as the fruit of the baobab tree in Central Africa and the pawpaw (papaya) and the guava in many parts of the tropics. Other sources of ascorbic acid include germinating cereal grains or legumes, whether eaten raw, or cooked, or prepared as local beer.

Human milk is a good source of vitamin C, provided the mother's diet is adequate in this respect. A breast-fed baby needs no other supply of ascorbic acid for the first six months of life.

Ascorbic acid is both water soluble and destroyed by heat. It will, therefore, be lost if vegetables are left soaking for too long or especially if they are overcooked.

Vitamin C plays various roles in the body's metabolism, but is especially required for the formation of the small blood vessels. Severe and prolonged deficiency of ascorbic acid produces scurvy. Because the walls of the small blood vessels become fragile, hemorrhages occur in the skin and gums, which become large, red and swollen and bleed easily when touched.

Vitamin D is unique in human nutrition, in that it can either be eaten or synthesized in the skin when the latter is exposed to the ultraviolet light of sunshine.

Vitamin D is required for the absorption of calcium from the bowel and the formation of strong, well calcified bones. Deficiency leads to rickets in children, which is characterized by soft, deformed bones.

It is difficult to give a realistic recommended daily allowance for vitamin D, because in tropical regions this nutrient is mostly synthesized by the skin. The occurrence of rickets will, of course, depend on various factors likely to prevent a child from being exposed to sunshine, including over-clothing, the degree of cloudiness and the avoidance of exposure. It is possible that vitamin D is synthesized less easily by children with darker pigmented skin.

A variety of different minerals is required in the diet for the healthy functioning of the human body, including some known as trace elements, which are needed in only extremely minute quantities. The present account will deal only briefly with several more important minerals - iron, calcium and iodine.

Iron is principally required for the formation of the red blood pigment, hemoglobin, which is responsible for carrying oxygen through the body. The newborn infant relies for his iron needs, in the early months of life, on the stores laid down in his liver during fetal life, again emphasizing the relationship between maternal diet in pregnanacy and the infant's subsequent nutrition. This is especially important since both human and cow milk, the principal foods most likely to be given during the first months of life, are poor sources of iron.

Dietary iron comes from both animal and vegetable foods. Meat is a good source, as in liver, kidneys and pancreas, but these sources are most unlikely to play a significant role in the diet of children in the tropics. Another source of potential significance to infants is egg yolk, which is, as a whole, much under-used in infant feeding in developing countries.

Of more practical consequence are dark, leafy vegetables, which are rich in iron, although, as with other vegetables, the content varies with the amount of iron in the soil. Grain cereals are also useful sources. Other factors which affect the amount of iron taken in include the concentration in drinking water and the use of iron cooking pots. The latter can raise the iron content of foods considerably.

Calcium is principally required for the formation of bones and teeth. In addition, a regular intake is required because there is a continual release and excretion of calcium from the skeleton.

The best sources of calcium are human and animal milks and their products and the bones of small fish. Vegetables, especially cereals and particularly millet, provide some calcium. The calcium content of water varies considerably but, in some circumstances, may supply a significant portion of the daily requirements.

Iodine is required for the normal function of the thyroid gland and, in particular, for the production of its hormone, throxine. Deficiency leads to a visible swelling of the thyroid gland (goiter). If large, this can be disfiguring or even cause pressure on the trachea.

Water, also, is a vital part of all diets. The human body is composed of over 60% water and an adequate daily intake is required to make good the loss in the urine, in the feces, in the moist, expired air and in perspiration, both visible and invisible. The turn-over of water is especially great in early childhood and the infant can easily become fatally dehydrated by extra water loss in the form of diarrhea or vomiting.

Water in the diet may be drunk as such, or it can be taken in various beverages (including milk, tea and alcoholic drinks). In addition, it is also taken "in disguise" as a part of fruits and in cooked dishes, as in porridges, gruels and stews. The amount of water required will, therefore, depend on various factors - the local climate, the degree of activity and on the intake of other water-containing items.

For young children, the risks of water must be understood. Most sources of drinking water in tropical regions are likely to be contaminated and are sources of bacterial infection which may lead to diarrhea.

SESSION 16

TYPES OF BEES AND THE BEE-HUMAN RELATIONSHIP

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW The type of bee, along with ecological and cultural factors, affects the bee-human relationship in an area. A good understanding of all these factors is necessary to decide upon an appropriate approach to beekeeping development. This session will prepare the Trainees to assess the beekeeping situation where they will be working and to adjust their skills to the area.

OBJECTIVES

- To discuss types of bees used for honey production.
- To identify features which distinguish wasps from bees.
- To list desirable traits in bees for beekeeping.
- To compare and contrast African and European bees.
- To discuss ways in which information on beekeeping with European bees or under temperate conditions needs to be modified to make it applicable to African bees or to tropical conditions.
- To discuss the impact of the African bee on beekeeping in Latin America (for the Inter-American region).
- To discuss the bee-human relationship.

RESOURCES

- *Small Scale Beekeeping*
- *Beekeeping in Zambia*
- *Beekeeping in Rural Development*, pp. 1-16.
- *Apiculture in Tropical Climates*, pp. 41-46, 61-68.
- *The Hive and the Honey Bee*, Chapter 2.
- "The Past and Possible Future Spread of Africanized Honeybees in the Americas"
- Attachment 16A, "European vs. African Bees"
- Attachment 16B, "Distribution of African Races of *Apis mellifera*" (for Africa)

MATERIALS blackboard, chalk, hand lens, preserved samples of African and European bees, world map, pictures and/or slides of various beekeeping situations, sugar water (2:1 water to sugar) in tray, insect net and kill jar

PROCEDURES

Trainer Note

○ A bait station should be set up a day before this session so there will be enough time to attract a variety of sugar-feeding insects. If there is a strong nectar flow, it may be necessary to use honey water (2:1, water to honey) or pure honey in order to attract any bees or wasps. An alternative to using a tray of sugar water is to spray the bait on foliage.

○ If there is beekeeping in the area with bees other than *Apis*, visit and observe this type of beekeeping during an ensuing field trip.

Step 1: **Bee Types** (30 minutes)

Assemble the Trainees at a bait station. Ask them to point out wasps and other types of bees feeding at the station, then ask them to describe the features which distinguish bees from wasps and from other insects. Briefly discuss the various types of bees, both *Apis* and non-*Apis*, used by humans. Distinguish between species and races in bees and show, on the map, the distribution of the four species of *Apis* and the major races of the western honey bee.

If possible, catch examples of the various insects and examine them with a hand lens.

Step 2: **Desirable Bee Traits** (25 minutes)

Question the Trainees as to traits they consider desirable in bees for beekeeping. Discuss these traits and have a Trainee list them on the chalkboard. Point out that this is a hypothetical list and that in selecting a line of bees, it is necessary to make trade-offs among the various desired characteristics.

Step 3: **The African Bee** (25 minutes)

Ask the Trainees what they know or have heard about the African bee. Relate this information to the characteristics of the African bee and relate the traits of the African bee to the list of desirable traits in bees.

Use Attachments 16A and 16B as resources for a short lecture on the African bee. Discuss the traits of European bees vs. those of African bees. Point out the distribution of African races of Apis. Recount the history of the introduction of the African bee into South America and its impact on beekeeping. Discuss the need for adjusting management techniques used for European bees in temperate regions to both the behavioral characteristics of the African bee and to tropical conditions.

Point out the "low management" nature of the African bee and relate this to the characteristics of many small-scale beekeepers. Also point out that because of the swarming tendency of African bees and their ability to exist as feral colonies in the tropics, they provide a ready and cheap bee resource for small-scale farmers who might like to start keeping bees.

Trainer Note

○ The timeliness and relevancy of this topic will vary greatly depending upon the areas in which the Trainees will be working. If more time is needed and/or if local resources are available on this topic, schedule a period during a "Bee Management Techniques" session.

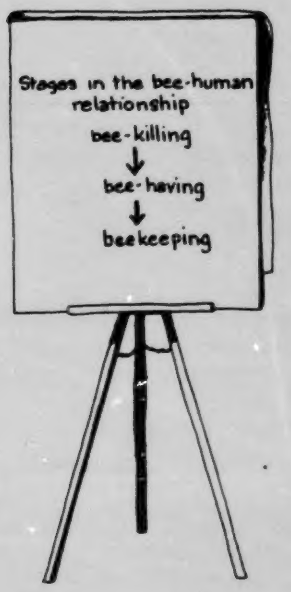
Step 4: **The Bee-Human Relationship** (25 minutes)

Discuss the phases of bee-killing, bee-having and beekeeping in the development of the bee-human relationship. Relate these phases to the cultural and ecological factors which shape them. Ask the Trainee what relevance to their future roles as Peace Corps Volunteers they see in understanding the development continuum of the bee-human relationship. Point out that in any development effort it is important to recognize the stage of development of the local technology and to tailor appropriate goals and technologies for that situation.

Step 5: **Session Evaluation** (15 minutes)

Trainer Note

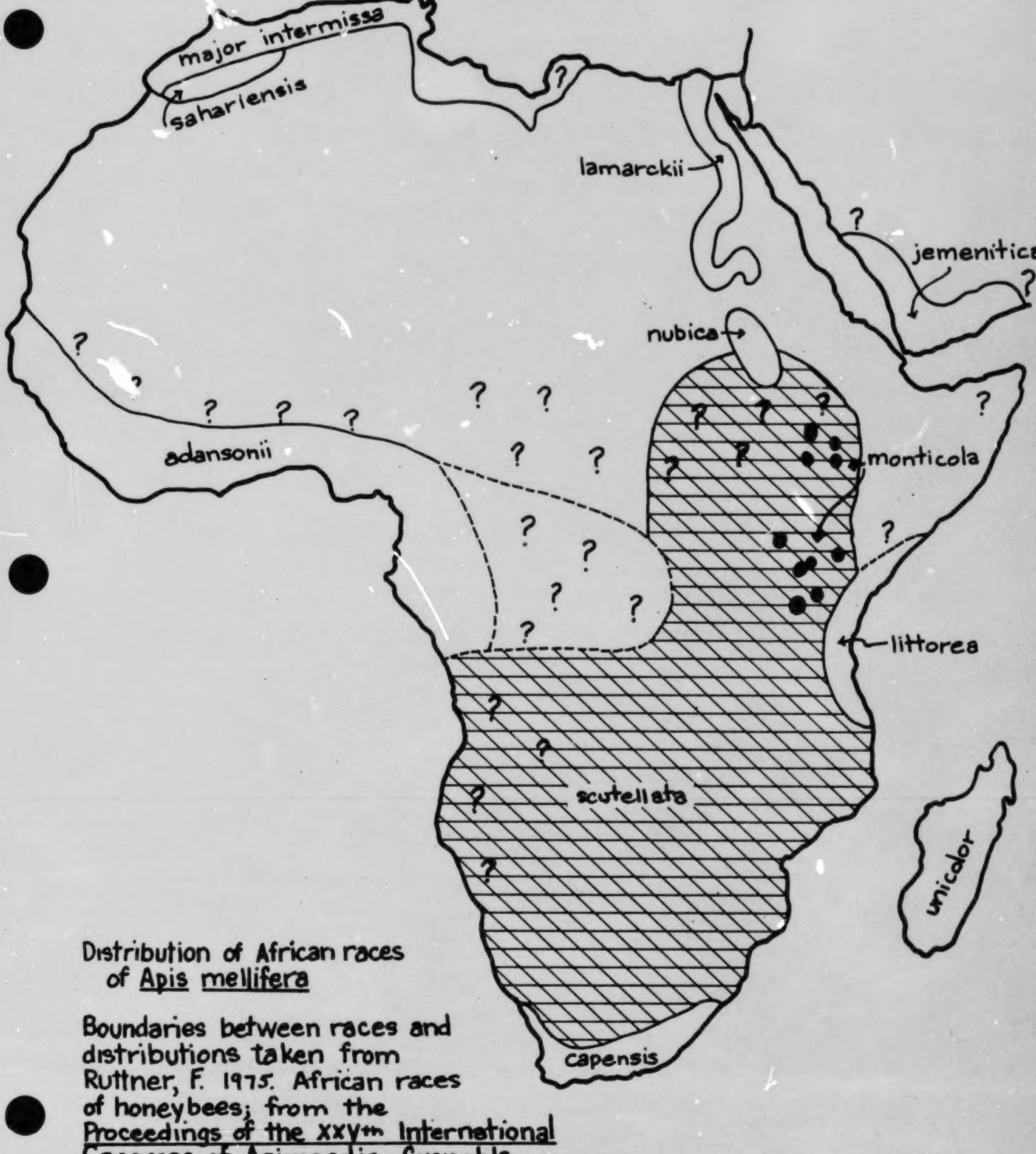
○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".


Stages in the bee-human relationship
bee-killing
bee-having
beekeeping

Attachment 16A

EUROPEAN	AFRICAN(IZED)
● Adapted to temperate zones - wild colonies do not have a high rate of survival in the tropics (i.e., no competition to beekeeping)	● Adapted to tropical zones - wild colonies are very common (i.e., much competition to beekeeping)
● Little swarming in the tropics	● Much swarming
● Little absconding (migrating)	● Much absconding
● A long association with beekeepers (i.e., characteristics have been selected as more desirable from the point of view of beekeeping) - gentle - do not run on the frames	● Have been hunted by bee-killers for gathering honey (i.e., no selection of desirable traits) - aggressive - run on the frames
● Respond to management	● Do not respond well to management
● Begin active foraging at a relatively higher level of resource availability	● Forage actively at relatively lower level of resource availability
● The strategy for survival is to maximize the survival of the individual (colony) (i.e., emphasis is on the storage of provisions)	● The strategy is to maximize the number of individuals (colonies) (i.e.,emphasis is on producing more colonies)

ATTACHMENT 16B


major intermissa
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sahariensis
lamarckii
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jemenitica
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nubica
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adansonii
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monticola
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littorea
?
?
scutellata
?
?
unicolor
capensis

Distribution of African races of Apis mellifera

Boundaries between races and distributions taken from Ruttner, F. 1975. African races of honeybees; from the Proceedings of the XXVth International Congress of Apimondia, Grenoble

SESSION 17

FORAGING

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW Foraging fulfills the resource needs of the bee colony. The quality, quantity and location of available forage affects behavioral responses of both individual bees and the colony. Practicing marking and following foragers in the field allows the Trainees to observe the communication of resource availability and location to other bees in the colony. Understanding the effects of the external environment on the bee colony is an integral part of successful beekeeping.

OBJECTIVES

- To review the resource needs of the colony.
- To examine factors which determine the types of forage collected.
- To practice marking bees.
- To study foraging behavior.
- To observe and discuss colony communication of resource sites.

RESOURCES

- _A Book of Honey_, pp. 7-23.
- _The Hive and the Honey Bee_, Chapter 7.
- _The Social Organization of Honeybees_, Chapter 4.

MATERIALS observation hive with bees, blackboard, chalk, several colors of fast drying paint, jar lids, sugar, water, honey, watch/timer, screen wire, container (1 liter), notepaper, pens, small container to hold captured bees

PROCEDURES

Step 1: **Reviewing the Resource Needs of the Colony** (10 minutes)

On newsprint, list and review the resource needs of the colony as detailed in Session 11, "Functional Biology of the Honey Bee". Define terms pertinent to this session, such as forage, forager and "communication dance". Encourage comments and discussion.

Step 2: **Defining the Activity** (10 minutes)

Explain that in the upcoming activity, Trainees will establish a feeding station. Bees, captured by the Trainees, from the observation hive, will be fed on honey or sugar syrup and marked with a spot of paint. Observing the marked bees' behavior upon returning to the observation hive will allow the Trainees to study communication of resource sites in a bee hive.

Ask the Trainees what equipment is needed and why.

Step 3: **Collecting the Equipment** (15 minutes)

Gather the necessary equipment for marking bees. Have Trainees volunteer to be in charge of mixing various concentrations of sugar syrup or getting honey, capturing bees, marking bees and timing the bees return flight to the colony.

Step 4: **Capturing the Bees From the Observation Hive** (15 minutes)

Demonstrate how to capture bees leaving the observation hive. Have the Trainees capture about 10 to 15 foragers.

Trainer Note

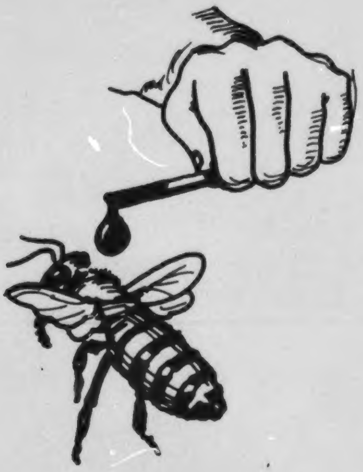
○ One way to capture bees is to fit a container formed from screen wire over the entrance tube of the observation hive. Bees will enter the container as they leave the hive. These bees will be old enough to be foragers and, therefore, will be able to locate and return to the colony once released in the field.

Step 5: **Marking and Feeding Bees** (30 minutes)

Demonstrate how and where to mark bees. Have the Trainees mark several bees. Feed the marked bees on the sugar syrup or honey. Record the time at the feeding station. Also, note the time needed for the marked bee(s) to return to the feeding station. Note any recruitment from the observation hive. Ask the Trainees if using honey or sugar syrup would elicit different responses from the observation hive during various times in the beekeeping session. Explain that during a nectar flow, honey will elicit more response from the colony.

Explain that some of the foragers will communicate a "false" location of the feeding station. Point out that this is because they will communicate the location of their original forage source, prior to being captured and fed at the feeding station.

Also, during this activity point out and discuss foraging behavior.



Step 6: **Observing and Discussing Colony Communication for Resource Sites**
(25 minutes)

Return to the observation hive. Observe any marked bees in the hive. Discuss the communication dances observed in the colony. Explain how differences in forage, differences in location of forage and other forage factors affect the communication process. Discuss forage characteristics which make it attractive to bees.

Trainer Note

○ Use the following alternative in situations where Trainees want to divide into groups to establish many feeding stations:

Have Trainees establish another feeding station in another location and at a different distance. Mark the bees a different color. Note differences in the communication within the colony.

Another variation is to use different concentrations of sugar syrup at a feeding station.

Step 7: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

SESSION 18

HIVE DESIGN CRITERIA AND SWARM BOXES

TOTAL TIME 2 hours

OVERVIEW Understanding beehive design parameters and the design process, in general, is important in assessing and introducing an appropriate beekeeping technology. In this session, the Trainees develop a list of beehive design criteria by drawing upon their own experiences in building and setting up a beehive. They then use some of these parameters to design an "improved" swarm box. The information and skills developed in this session will prepare the Trainees to critically appraise beekeeping equipment and systems for appropriateness to the areas in which they will be working.

OBJECTIVES

- To develop the parameters for designing beehives.
- To review and discuss the different qualities of bee hives.
- To design an "improved" swarm box.
- To present and evaluate the designs of the swarm boxes.
- To discuss the basic concepts of the design process.

In regions where the African bee is present and swarm boxes are useful in beekeeping development programs:

- To construct and test an "improved" swarm box or Johnson hive.
- To practice/acquire carpentry skills.
- To work together effectively, in groups.

RESOURCES – Small Scale Beekeeping, pp. 82-84.

MATERIALS chalkboard, chalk, sample piece of 5-mesh hardware cloth (5 holes per 2.54cm), newsprint, markers, Langstroth hive, KTBH

PROCEDURES

Step 1: **Beehive Design Parameters** (35 minutes)

Point out that establishing design parameters or criteria is the first step in the overall design process. Relate this to the session objectives.

Question the Trainees about the parameters important in beehive design. Guide the group in developing the following list of qualities of beehives:

- cost
- access to honey comb
- access to brood nest for inspection
- exchange and/or replacement of combs
- separation of brood comb from honey comb
- materials necessary
- possibility of increasing or decreasing space
- carpentry skills and carpentry equipment needed
- potential for management

Use a Langstroth hive and a KTBH to point out and discuss how each hive specifically meets the design parameters or qualities.

Point out that the better one can match the cost and design of a hive to the nature of its "use" (i.e., bee-killing, bee-having or beekeeping), the more economical and practical the hive will be. As an example, discuss the KTBH and note that it is appropriate for low-management beekeeping. Relate this to the concept of appropriate technology.

Step 2: **Swarm Boxes - Introduction** (10 minutes)

Ask the Trainees to speculate on the design and function of swarm boxes. When swarm boxes are defined, question the group as to the appropriateness of swarm boxes in beekeeping development programs. Relate the appropriateness of swarm boxes, both to the socio-economic factors of the beekeepers and to the characteristics of the bee in the area.

Step 3: **Designing an "Improved" Swarm Box** (35 minutes)

Show the Trainees a sample piece of 5-mesh hardware cloth and introduce the idea that it can serve as a low-cost queen-excluder. Ask them to design an "improved" swarm box (or simple hive) based on the following criteria:

- It must give access to honey comb.
- It must provide for separation of brood comb from honey comb.
- It must be buildable in three hours.
- It must use only wood, nails, hardware cloth.
- It must be built only with hand tools.
- It must be practical as a swarm box.

Emphasize that in the design process, specific criteria such as these are more useful than general ones.

Have the Trainees work either in groups or individually to design an "improved" swarm box.

Provide the Trainees with newsprint and markers so that they may prepare their designs for presentation to the group.

Step 4: **Presentation of Designs** (25 minutes)

Have the Trainees present their designs. Allow time after each presentation to give feedback on the presentation and design. Ask Trainees what they liked best about the presentations and the swarm box designs and what suggestions they might have for improvement.

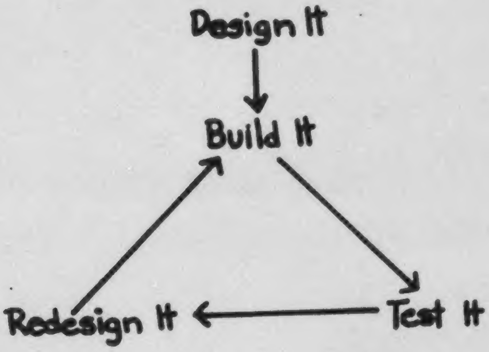
Trainer Note

○ The Johnson hive design provides a standard with which to evaluate the Trainees' designs.

Step 5: **Conclusion** (15 minutes)

Introduce the design plan of the Johnson hive (Small Scale Beekeeping, p. 82). Ask the Trainees how their designs differ from or are similar to the Johnson hive. Ask them what difficulties might be encountered in attempting to introduce either the Johnson hive or their designs to local beekeepers.

Question the Trainees as to the next step to take after completing a design. Develop, on the board, the following overview of the whole design process:



Emphasize that no design is complete until it has been tested and retested and that every new design requires redesign and rebuilding.

Relate the design process to the role of a Peace Corps Volunteer by pointing out the importance of being flexible and remaining open to new ideas and situations.

Trainer Note

○ If Trainees will be working in areas where swarm boxes are valuable to beekeepers (i.e., in areas where there is a high incidence of swarming in the local bee), it will be valuable for them to actually build a Johnson hive or an "improved" swarm box of their own design. A "Bee Management Techniques" session is scheduled for the afternoon. Where applicable, this time should be used to construct the swarm boxes. Have the Trainees divide into groups for this activity.

SESSION 19

ROLE OF THE VOLUNTEER IN DEVELOPMENT

TOTAL TIME 4 hours

OVERVIEW The role of each Peace Corps Volunteer is determined not only by a particular job description, but also by personal working styles and beliefs about appropriate approaches to development work. In this session, Trainees have the opportunity to assess their working styles and discuss the potential effects of those styles on their work as Peace Corps Volunteers. They examine different approaches to development and, through role play, explore the issues related to those approaches.

OBJECTIVES

- To identify a personal style for working with others.
- To discuss the potential consequences of those styles in development work.
- To discuss approaches to development.
- To identify issues related to various approaches to development.
- To practice role play techniques.

RESOURCES

- Handout 19A, "Working Style Inventory"
- Handout 19B, "Continuum of Volunteer Helping/Work Styles"
- Handout 19C, "Extension, Training and Dialogue: A New Approach for Tanzania"
- Handout 19D, "Role Play Descriptions"

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ Prior to beginning this session copy Handout 19D and cut out the four "Role Descriptions" such that one copy of each description can be distributed to each of the four role play groups described in Step 3.

Step 1: **Personal Working Styles** (40 minutes)

Explain the session overview and clarify each of the objectives. Distribute Handout 19A, "Working Style Inventory". Have the Trainees read the instructions, do the inventory and score themselves afterward. Answer any questions which may arise. Suggest that Trainees move through the situations on the inventory without spending too much time on any one. Explain that there are no "right answers" and that the objective is to develop an accurate assessment of their working style. Any attempts at "second guessing" the inventory are defeating the purpose.

When the Trainees have finished calculating their scores, distribute Handout 19B, "Continuum of Volunteer Helping/Work Styles". Ask them to read the explanation of the styles provided on the handout. Ask for a show of hands of high scores in each of the four categories of styles. Discuss the continuum diagrammed at the top of the handout. Ask the Trainees to identify "who is responsible for the work" on each side of the diagonal line. Have them determine the extent to which dependency and/or self-reliance are being fostered by each working style. Discuss whether or not they feel that the inventory is an accurate reflection of their working style; and, if not, why?

Step 2: **Working Styles Continuum** (50 minutes)

Have the Trainees divide into pairs, such that each person in each pair scored high in a different category of the continuum. Have each pair discuss how they rated:

- those situations which seemed most interesting,
- those which seemed most difficult or perplexing, and
- those which they feel most strongly about.

Allow approximately 20 minutes for this discussion. Reassemble the large group and conclude the working styles activity by facilitating a discussion of the following questions:

- What are the critical factors to be considered in each situation?
- What might be some consequences of a tendency toward any one style?

- What are the long term/short term effects of each working style?
- How does your need to establish credibility and your need for positive reinforcement influence your working style?
- Is self-reliance a desirable goal in all cases?

Step 3: **The Dialogue Approach** (1 hour)

Point out that the issue of dependency versus self-reliance will be examined further during the remainder of this session. Distribute Handout 19C, "Extension Training and Dialogue: A New Approach for Tanzania", and ask the Trainees to read it. Explain that, as a means of exemplifying some of the ideas in the article, the Trainees will be asked to do some role plays.

Divide the Trainees into four groups. Distribute to each group one copy of one of the four "Role Play Descriptions" from Handout 19D. Have each group meet privately, for approximately 20 minutes, to read their "Role Description" carefully and to develop a plan for meeting the objective stated at the end of the description.

Trainer Note

○ In addition to the situations described in Handout 19D, other topics which can be developed into effective role plays include:

  - The introduction of non-native bees to new areas: There is often a conflict between individuals who want to introduce non-native bees to an area and others who recognize the value of the native bee stock (see Attachment 21A).
  - The use of artificial insemination: There are those who see artificial insemination as a panacea for improving local bee stock, while others see it as a costly and inappropriate technique.

Step 4: **Role Plays** (1 hour)

Reconvene all the Trainees in the classroom. Have Groups 1 and 2 present their role play while Groups 3 and 4 observe. Then have Groups 3 and 4 do their role play while Groups 1 and 2 observe. Following each role play, take time to discuss some of the points which were presented. Focus the discussion by asking such questions as:

- What were some of the apparant motives of the characters?
- What conflicting approaches to development work were brought out?
- Was there any resolution among the various perspectives?

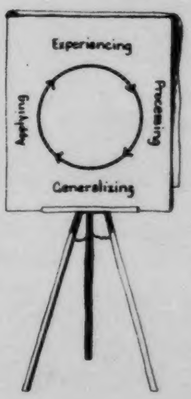
Ask the Trainees to briefly describe situations in which they feel role plays might be used as effective teaching techniques in their work as Peace Corps Volunteers.

Trainer Note

○ Within the framework of time allotted for this step, be flexible regarding the length of time to allow for each role play presentation. Allow each presentation to flow naturally for as long as it seems productive and animated.

Step 5: **Summary and Conclusion** (30 minutes)

Conclude the session by asking one of the Trainees to summarize the major themes which were treated and to determine whether or not the objectives were met. Remind the Trainees of the Experiential Learning Cycle which was discussed in Session 8, "Adult Learning and Method Demonstration - An Introduction to Basic Insect Anatomy". Draw the cycle on newsprint and ask the Trainees to describe how the activities in this session fit into the cycle. Then ask them to describe how the "dialogue approach" to development might also relate to the four stages of the cycle.



HANDOUT 19A

Working Style Inventory*

Self-Assessment

Ten situations typical of those faced by Peace Corps Volunteers in the past are described below. Four different ways of handling each situation are then described. Select the way you think you would be most likely to handle each situation and assign the number "4" to that choice. Select your next preferred choices and the least preferred choice. Assign your numerical choices directly on the scoring sheet attached to this Self-Assessment form.

This form is designed to help you assess your own personal preferred style of handling situations which you are likely to face during service as a Volunteer. Later, you will analyze the results yourself.

ASSIGN A "4", "3", "2", OR A "1" IN THE ORDER OF YOUR PERSONAL PREFERENCE FOR HANDLING EACH SITUATION DESCRIBED. PLACE YOUR RESPONSES DIRECTLY ON THE SCORING SHEET ATTACHED TO THIS SELF-ASSESSMENT FORM.

SITUATION #1

You are entering your assigned village to take over an appropriate technology project. The Volunteer you are replacing has already left. The project is three years old. You have had brief discussions with the village leadership and get the sense that the project is being received with mixed results. You have been asked to address a meeting of village leaders to introduce yourself. How would you prefer to handle the situation? (Respond on the Scoring Sheet.)

Choices

A. Present your approach to the project and ask for questions and advice.

B. Seek the leadership's view of the project and identify problems.

C. Ask the leaders to describe their goals for the project as well as other pressing needs the village is facing.

D. Ask the leadership if you can sit in on this meeting and become better acquainted with village needs before addressing a meeting.

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* edited from: The Role of the Volunteer in Development, Peace Corps Core Curriculum Materials, December 1981, OPTC, U. S. Peace Corps, pp. 67-82.

SITUATION #2

You are assigned to a small vegetable cooperative project which has been underway for several years. There is very high interest in the project among the village at large. However, the local leadership has just decided all coop labor must be assigned to re-building the bridge recently flooded out during the rainy season. This is planting time for the vegetable coop. What would you do?

Choices

A. Persuade the leaders to change their priorities, at least to enable the once-a-year planting in the vegetable fields.

B. Help the leadership identify some alternatives to choosing between the vegetable crop and the bridge.

C. Help the local vegetable coop manager develop strategies to try to get the local leaders to reconsider.

D. Join in and facilitate bridge repair in an effort to complete it in time to also plant vegetable plots.

SITUATION #3

You are in the last six months of your tour. It is unclear whether you will be replaced by another Volunteer. The local project committee is urging you to be sure to finish a gravity irrigation project before you leave. You are not sure you can complete it in the time allotted. How will you handle this pressure?

Choices

A. Try as hard as you can to complete the project.

B. Lead a planning meeting with the local project committee and staff and try to develop alternate strategies.

C. Concentrate on developing skills in the local project staff to enable them to complete the project after your departure.

D. Pass the dilemma on to the local project staff leaders and encourage them to solve the problem and tell you what to do.

SITUATION #4

A new counterpart has been assigned to your food production project. The new counterpart does not have the connections with local district officials which the previous counterpart had and seems unable to use connections to get needed inputs. If you do not get the needed inputs soon, serious food shortages could result. What will you do?

Choices

A. Use your previous associations through the past counterpart to ensure the required inputs are received in time.

B. Develop strategy with new counterpart to provide introductions and contacts to enable the project to get inputs in time.

C. Ask new counterpart to develop plan to get inputs and critique plan.

D. Encourage new counterpart to go out and try to figure out how to get needed inputs.

SITUATION #5

You have taken over an agricultural production project of the "green revolution" type with a "most promising farmer" orientation. There are two very progressive farmers using the new technologies and greatly increasing their cultivated land. Most farmers in the area have not adapted the new practices. The village leadership is predicting scarcity to starvation next year if food production is not greatly increased. Where will you focus your time?

Choices

A. On increasing food production by whatever means, including using the progressive farmers as "model" farmers for others.

B. Balanced between encouraging the progressives and working directly with more traditional farmers.

C. Organizing traditional farmers and training them in new agricultural practices.

D. Identifying why traditional farmers are not adopting new agricultural practices.

SITUATION #6

The village to which you have been assigned has a beekeeping project going and is highly motivated about it. Your assignment is a general agricultural assignment, but you happen to know quite a bit about beekeeping and see some ways to help improve their already successful project. They have shown no interest in using you in that way. How will you respond?

Choices

A. Speak to village and project leaders laying out some of your ideas for improving the project and suggesting a change in your assignment.

B. Make suggestions from time to time, informally, demonstrating your competence in this area.

C. Share your dilemma with your counterparts, seek their advice and follow it.

D. Move ahead with your assignment as planned, being alert to any future opportunities to be helpful in an informal way with beekeeping.

SITUATION #7

You are beginning the second year of your two-year teaching contract. You have been able to introduce some innovative methods and students and fellow faculty have responded well and begun to adopt them. Some students in particular have "blossomed" under your direction. What are your priorities for the next eight months?

Choices

A. Focus on blossoming students and bring more into the fold.

B. Organize special teacher-training seminars to broaden and deepen innovations already adopted.

C. Seek opportunities to co-teach with counterparts to solidify innovations already adopted.

D. Begin planned withdrawal to lessen the dependency on you for sustaining innovations adopted.

SITUATION #8

You are a health and nutrition specialist for a community clinic with a very vague and general assignment. The needs surrounding you are overwhelming, but you don't know where to begin. The clinic director seems glad to have you but has provided no specific direction. How will you begin?

Choices

A. Assess your strongest field and make a concrete proposition to the director to clarify your role.

B. Ask for a meeting with the director to mutually explore priorities for the clinic and ascertain where you can be most helpful.

Choices (continued)

C. Ask your counterpart(s) if you can observe them for a month in hope of identifying areas where your skills can complement theirs.

D. Conduct a community needs assessment and develop your role in response to community needs.

SITUATION #9

Your counterparts are becoming increasingly dominating during project community meetings. As their confidence and skill has grown, you have gladly given more responsibility to them; but it seems to you that other committee members are becoming withdrawn from the project. You want to build a strong project team, rather than just strong counterparts. What should you do?

Choices

A. Raise the issue directly with your counterparts and offer to lead the next committee meeting to demonstrate participative leadership skills.

B. Provide help in planning the next meeting and make some specific suggestions to the counterparts about how to modify leadership behavior.

C. Watch for opportunities to provide feedback, ask the counterparts questions about how they think the meetings are going and reinforce participative behavior.

D. Leave the situation alone and count on the community to call the counterparts on dominating behavior, then reinforce the offer to help.

SITUATION #10

Your counterpart is moderately skilled and experienced and moderately interested in your project. He or she does not see the project as advancing his or her own career. The village, however, is vitally interested in the project. How would you handle this situation?

Choices

A. Try to get counterpart reassigned and temporarily take over direction of the project until a new person is assigned.

B. Spend time with counterpart trying to identify ways in which his or her role in the project can both meet project goals and career aspirations.

C. Work with counterpart on career goals and help him or her develop a strategy for pursuing them, including leaving the project, if appropriate.

Choices (continued)

D. Facilitate a meeting between community leaders and the counterpart to see if they can come up with a mutually satisfactory solution to the problem.

SCORING SHEET

Situation #1	A	B	C	D
Situation #2	A	B	C	D
Situation #3	A	B	C	D
Situation #4	A	B	C	D
Situation #5	A	B	C	D
Situation #6	A	B	C	D
Situation #7	A	B	C	D
Situation #8	A	B	C	D
Situation #9	A	B	C	D
Situation #10	A	B	C	D
TOTALS	______	______	______	______

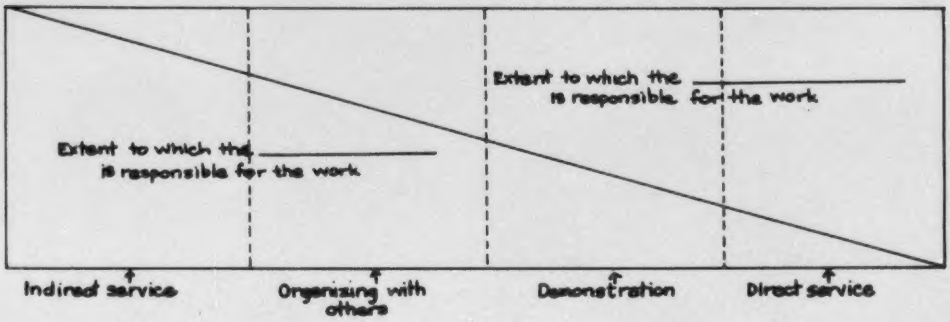
Instructions:

Enter your responses for each of the 10 situations. Assign a "4" to your first choice, a "3" to your second choice, a "2" to your next choice and a "1" to your last choice in each situation.

When you have responded fully to each set of choices, total the number vertically in each column.

Handout 19B

CONTINUUM OF VOLUNTEER HELPING/WORK STYLES


Extent to which the ______
is responsible for the work
Extent to which the ______
is responsible for the work
Indirect service
Organizing with others
Demonstration
Direct service

COLUMN A: DIRECT SERVICE

This is a direct approach in which the Volunteer mostly does the work, gets a project organized, provides a needed service where none exists and generally takes the initiative for making things happen. In most instances, this means that the Volunteer takes responsibility for the action or project, and that a counterpart may or may not get involved - and even if involved, will look to the Volunteer for action and leadership.

COLUMN B: DEMONSTRATION

In this approach or situation, the Volunteer spends most of the time demonstrating to others how to do something, but also spends a lot of time doing it themselves. Most often the responsibility is shared with one or two counterparts. The work is a combination of direct service and training/demonstration, often with the Volunteer sharing some responsibilities with a promising local leader or an assigned counterpart.

COLUMN C: ORGANIZING WITH OTHERS

In this system, the Volunteer encourages and stimulates promising counterparts and others in the community, generally - although not always - working with people rather than directly on projects. (NOTE: Throughout this session, we use community in its most generic sense - it could be a school community, an agricultural office, or a town or section of a city). The focus is on building leadership and helping a group or organization develop which will continue the work. The primary work is behind the scenes using influence, assisting as a resource in developing alternative solutions which the people choose or generate themselves, serving in a training capacity, occasionally serving as a role model in doing work and so on.

COLUMN D: INDIRECT SERVICE

In this approach, the Volunteer responds to a range of situations and problems raised in volunteer work by helping others solve their own problems; the Volunteer does not direct any of the work but concentrates on helping the people define and refine their perceived need. Help is given only on request, rarely initiated by the Volunteer. The Volunteer may even come and go, leaving the project to do something else and thus reinforcing the autonomy of the group. The way the Volunteer works is primarily clarifying, asking questions, listening a lot and facilitating.

Extension, Training and Dialogue: A New Approach for Tanzania

Dr. James De Vries*
Journal of Adult Education
University of Dar es Salaam

Extension, Education and Development

Training and extension work with farmers is both an educational effort and a means of development and a part of that development. Before we can begin to criticize traditional training and extension techniques and advocating new ones, it is important to be clear what we mean by development and how training and extension work relate to this goal. Until recently, development was usually defined in economic terms such as changes in the Gross National Product, per capita and economic living standards. Training and especially agricultural extension were viewed as an economic development tool; as an investment in human capital on which a return was expected. This implied a directly functional approach to teaching and learning which was focused on "practical" skills and immediate pay-offs.

This view has changed over the past ten years due to concerns about income distribution, dependency on government and other social and political concerns. Now almost every statement about training and development mentions the importance of participation, mobilization, equality and self-determination. Since independence, the party and the Tanzanian government have defined development as liberation. Development is:

> A permanent revolution for the total liberation of the people of Tanzania and Africa from all forms and manifestations of domination, exploitation, oppression, humiliation, weakness, racism, poverty, ignorance, disease and misery (Daily News, 1975).
>
> For development has a purpose: that purpose is the liberation of man. It is true that in the Third World we talk a great deal about economic development -- but the goods are needed to serve man; services are required to make the lives of men more easeful as well as more fruitful. Political, social and economic organization is needed to enlarge the freedom and dignity of men; always we come back to man -- to liberated man -- as the purpose of the development activity (Nyerere, 1976).

Development is thus more than a change in material welfare, farming practices or yield per hectare or return per man-day of labor. Development involves changing people, changing their consciousness or awareness and helping them to become "beings for themselves" -- making their own political , cultural and economic decisions. "The expansion of (man's) own consciousness, and therefore power over himself, his environment and his society, must therefore ultimately be what we mean by development" (Nyerere, 1976).

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* Edited by the Training for Rural Development Staff - Tanzania

Education is thus both an end and a means of development. Development which depends on the actions of men requires a change in their consciousness, so that they are the determinant of their own actions. Farmers follow a given practice not because of traditionalism, but because they see it as the best method in the face of their own particular situation. To change these practices either demands force or a change in awareness which convinces them that a different form of action better meets their needs.

Raising the farmers' awareness is the role of both training and extension work. "Adult education has to be directed at helping men and women to develop themselves -- to think clearly -- to examine possible alternative courses of action; to make a choice between those alternatives in keeping with their own purposes; and to equip them with the ability to translate their decisions into reality" (Nyerere, 1976). The "developed" farmer is not the one who is "progressive" or follows the recommended practices (although he or she may do this); rather the developed farmer is the one who is critically aware of his or her situation and acts on it in accordance with this awareness.

The Traditional Approach

Education and extension in Tanzania and other developing countries have received a great deal of criticism. While in part this is unfair because of unrealistic expectations and a failure to see training and extension in the context of other factors influencing development work, much of the criticism is deserved. Part of the blame can be put on the traditional training and extension approaches used in the villages and elsewhere. This approach has variously been called the banking, empty cup, directive or top-down approach. Its essence is that the trainer or extension worker is the expert who knows (full cup) and tries to give (deposit as in the bank) this knowledge to the farmer or villager (empty cup) whose role is to passively receive and acknowledge what was received from the expert.

The assumption underlying this relationship is that the trainer or agent knows what is good for the farmer or village. Thus, the relationship is vertical and assumes a one-way flow of information from the top down. The farmer or villager is seen as ignorant, lacking knowledge, traditional and resistant to change. This means he or she is helpless and must be helped to develop, almost in spite of themselves. The farmer or villager is the passive learner, while the trainer or extension agent is the active educator.

In practice, what this boils down to is that the trainer or agent, whether at a meeting, demonstration program or training session, is always in the position of telling villagers what to do. He tries to provide them with solutions to their problems much in the same manner a doctor provides prescriptions to medical problems. In a village, one may find a list of the "ten commandments" of good farming posted. In a meeting one will hear the Katibu Kata exhort farmers to weed properly and the Bwan Shamba telling them that eight sprayings of insecticide are necessary to produce good cotton. Farmers rarely raise objections, because they know that such objections are not welcome and often accept the role of the ignorant, passive listener because they are continually told they are. They, therefore, exist in an oppressive environment over which they exercise little control. If they do object, they are quickly silenced by references to "wataalamu" research and "modern methods" (meaning they are ignorant and traditionalistic) or they need to work (meaning they are lazy). Rather than objecting openly and thus offering to educate the trainers of extension workers and be educated in return, most farmers remain silent. They go home and fail to put into practice what was suggested, even when they may have agreed to do so in the meeting.

The failure of farmers to follow the expert's advice is discouraging to the expert and reinforces the feeling that farmers irrationally resist change. As a result, educators and extension workers tend to work with those few who seem more open to their suggestions -- the "progressive" farmers -- and to advocate the use of pressure to force farmers to use recommended practices for their own good. As one RADO told me, "A farmer who refuses to follow recommended practices is like a sick man: you have to force him to eat and he will thank you for it when he becomes better."

Failure of the Top-Down Approach

Unfortunately, the farmer often does not become "better" in the sense that he or she obtains a significant benefit from the forced practice. This reveals one of the fallacies underlying the traditional approach: the assumption that all recommended practices are good and that the experts are always right. Experience and research in Tanzania have shown that many practices either recommended to the farmers or forced on them did not benefit the farmers and their rejection of them was quite rational.

Some recent examples are:

1. The use of fertilizer on maize in the lower altitude areas of Morogoro, Tanga and Iringa Region.
2. Growing maize and many other crops in monoculture.
3. Early planting and close spacing of cotton.
4. Production of cotton in many areas of the "Eastern Zone".

Thus, while many recommendations are good, experience has shown that when evaluated from the farmer's perspective, many do not solve the farmer's most pressing needs and are, therefore, unacceptable.

This brings up the second fallacy of the top-down approach: the assumption that farmers and villagers are ignorant. It is true that many of them have little formal education and are illiterate. It is not true that they have learned nothing and know nothing. (It is unfortunate that in Swahili, the same word, ujinga, can be used for both illiterate and ignorant, because the two cannot be equated.) Farmers, through experience and the informal sharing of ideas, have developed a wealth of knowledge about agricultural production and survival in an often harsh environment. They also have a better understanding of their problems, needs, priorities, resources, values, attitudes, local culture, etc. Educators and extension agents tend to be outsiders and members of a different socio-economic class.

Thus, both the extension agent or trainer and the farmer or villager have some knowledge necessary to bring about changes in practices. The scientific knowlege of the researcher needs to be complemented by the more natural knowledge of the farmer to bring about a critical understanding of the problem and the basis for action.

The third major fallacy of the top-down approach is the assumption that knowledge can be given or extended by the trainer and extension agent. Knowledge cannot be poured into the adult learner like tea into a cup. Informed action develops in learners as a result of interaction with information, the situation and fellow human beings. Learning is not an activity of the trainer, but of the learner, and involves a change from one way of understanding or doing something to another. Adults, in particular, have developed attitudes and ways of doing things. Learning often involves the rejection of existing ideas and acceptance of new ones.

This leads to the importance of understanding the farmer's present knowledge and understanding and these must form the foundation of any new learning. Only an active interaction with ideas and other people can result in the learner really understanding new ideas and making them his or her own, instead of them merely being someone else's ideas.

Finally, another major criticism of the top-down approach, particularly important in the Tanzanian context, is that it builds a dependency relationship between experts (often seen as representing government) and farmers and villagers. It means presenting the farmers with solutions to their problems, defined in the first place by the experts, instead of analyzing their problems with them, in order to fully understand them and coming to a solution cooperatively. The traditional approach makes the farmer feel dependent on the continued advice of the trainer or extension agent, as it fails to teach him how to analyze and solve problems on his own. While the government and the party have accepted liberation as the major goal of development, the top-down approach to adult education and extension work encourages dependency and passivity.

Instead of seeing men and women as the means of development, it treats them as a means, tools to be manipulated as efficiently as possible in order to achieve the goals of those in power. In the face of the above, it seems fair to conclude that the present, prevailing approaches to adult education and extension work are not only ineffective but actually are detrimental to the development of Tanzanian farmers and villagers.

The Dialogue Approach

The dialogue approach, illustrated in Table 1, is the opposite of the traditional, top-down approach. Its essence is the horizontal sharing of ideas between trainers/learners, learners/trainers in a process of reflecting and acting on the world in order to understand it and control it better. It is based on faith in people, in their ability in cooperation with others, to be able to understand self and situation and to act on it and change it.

The dialogue approach assumes that both the trainer or extension agent and the student or farmer know something about the subject of interest, especially if the goal is for the learner to apply what is to be learned. Although one may have more general or abstract knowledge and the other may have more informal and specific knowledge, this difference does not make one or the other superior in the situation. It is the shared knowledge both have in the situation which is superior. Within the constraints of each party's environment, each can learn and change as a result of interacting with each other.

While all farmers have some knowledge, they are not always aware of this knowledge. In fact, because they are constantly told that they are backward, lazy, ignorant and thereby made to accept that they are "hopeless", they often feel that they know nothing. When farmers can be drawn out in dialogue as a group, they are often surprised at how much they already know, collectively, about a wide range of production or development problems. It is important, in the beginning, to draw out what the farmers or villagers already know to be able to build on it. As Mwalimu Nyerere points out, by drawing out what the farmers know (which can only be done through dialogue) and showing the relevance of what is known to what is being learned, the trainer achieves three things:

> He has built up the self-confidence of the man who wants to learn, by showing him that he is capable of contributing. He has demonstrated the relevance of experience and observation as a method of learning to be combined with thought and analysis. He has shown what I

call the "maturity" of learning -- that is, by sharing our knowledge, we extend the totality of our understanding and our control over our own lives.

The trainer's role in dialogue is not to present knowledge to the learner but to lead the learner to an examination of problems -- to ask the learner to critically reflect and act on problems (problem-posing). Knowledge or learning grows out of this reflection-action cycle. The farmer will never learn the benefit of a practice and the problems associated with it until he has actually tried it and then thought about his experience critically.

Traditional Approach	Dialogue Approach
1. Educators teach and farmers are taught.	1. Educators and farmers are both involved in learning.
2. Experts know everything and the farmers know nothing.	2. Both have knowledge to contribute to joint learning.
3. Educators possess the authority of knowledge and have a monopoly on it -- which they perpetuate.	3. Knowledge is the property of everyone. No one can or should monopolize it.
4. Educators/experts think and farmers are thought about.	4. Farmers are encouraged to think on their own.
5. Educators/experts are active and farmers are passive during learning.	5. Both educators and farmers are active during learning.

Table 1

Neither the trainer or extension agent will know the value of his ideas until he has shared them with the learner and tested them out against the farmer's perceptions and experience. Dialogue thus requires both action and reflection, experience and thought. Without action, teaching is merely verbalism and amounts to exhorting the farmers to do this or that without showing them how to do it and, thus, has limited impact on their farming practices. Without reflection, extension work can become mindless activism in which farmers are forced to follow certain practices without understanding them and without the farmers themselves being developed.

Is Dialogue Feasible?

Let us examine two objections to the use of the dialogue approach often made by extension agents, educators and government officials.

1. The first is that it is impossible to dialogue with farmers or villagers because they know little or nothing about modern agriculture or how to make a village cooperative work.
2. The second objection is that it is too slow and expensive, that our problems need urgent solutions and, therefore, cannot wait for a long process of dialogue to take place.

HANDOUT 19D

Role Play Descriptions

Description 1: (for Group 1)

You are an elected group of village leaders. You are concerned about the welfare of the people of your village. Other development organizations have attempted to implement projects in your village without producing any real, tangible results. All they wanted to do was talk. They suggested expensive, long-term projects which the people rejected. You have seen Langstroth beekeeping equipment and have heard that it can be obtained free from the Ministry of Agriculture. You are convinced that this "modern" equipment is just what your village needs to get its beekeeping activities off the ground. Elections are coming up in a few months and you feel that providing this equipment to the village would greatly increase your chances for re-election.

You are about to meet with a group of recently arrived Peace Corps Volunteers. Your objective is to solicit their help in acquiring and establishing the Langstroth hives as soon as possible.

(Cut here for distribution)

. . . .

Description 2: (for Group 2)

You are a group of beekeeping extentionists who have only recently been sworn in as Peace Corps Volunteers. You are eager to start working somewhere, yet, you are also convinced that the best approach to development is one of careful needs assessment, maximum use of available resources and promotion of self-reliance. In training, you learned that the Kenya Top Bar Hive (KTBH) was preferable to Langstroth equipment in your area. You know that the KTBH produces relatively more wax than the Langstroth; that it is cheaper to build; that it can be more easily made from available materials; and that it is more suitable for the African bee. You have been visiting various villages in the area and assessing their potential for initiating beekeeping projects.

You are about to meet another group of village leaders. Your objective is to convince them to work with you to assess whether or not their village might want to begin beekeeping.

Description 3: (for Group 3)

You are the staff of a regional extension office of the Ministry of Agriculture. You have all had several years of experience and you feel that you know your people quite well. You have worked with foreign development workers in the past. Experience has shown you that foreigners can be valuable resources in many ways but that only a native of your country can truly understand the culture and motivate its people effectively. You are sincerely dedicated to helping your country progress and "modernize" its methods. You are convinced that the only way to do this is to set up examples of modern techniques which the people will eventually come to see as better than older, more traditional approaches. Your supervisor has told you to set up a pilot project of fifty functioning Langstroth hives in a nearby village. You don't know a great deal about beekeeping but you like the idea. You do know that the Langstroth equipment is the most modern and efficient way to manage bees and produce honey.

You are about to meet with a group of beekeeping Volunteers. Your objective is to convince them to help you set up and manage the pilot project.

(Cut here for distribution)

. . . .

Description 4: (for Group 4)

You are a group of beekeeping Volunteers who have been working in the country for several months. You feel that you have learned a great deal about the culture and about the needs of the people. You have grown to respect traditional values. Many of the traditional agricultural techniques have proven to be much more appropriate than the so called "modern" approaches. You believe that beekeeping can be an effective income-generating activity but that it is not necessarily for everyone. You are convinced that the Kenya Top Bar Hive (KTBH) is the most appropriate for the area because it favors wax production; it is cheap and easy to build; it is more suitable for the African bee; and it is generally acceptable to the people.

You are about to meet with a group of local extension agents who want to set up a pilot beekeeping project in a nearby village. Your objective is to convince them that, before setting up the project, they should assess the receptiveness of the village and decide whether the Langstroth hive or the KTBH would be best for the project.

SESSION 20

THE BEE SPACE AND TYPES OF HIVES

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW

An understanding of the bee space provides the basis for constructing moveable-comb and moveable-frame beehives. This session discusses the bee space and relates its importance to hive types; examines the factors which determine the types of hives used in various regions; addresses the problems of using Langstroth hives in a development situation and explores possible substitutes for some of the high-technology inputs. This session will provide the Trainees with technical, cultural and ecological criteria by which to choose an appropriate type of hive for the area in which they will be working.

OBJECTIVES

- To discuss the bee space and its implications in hive design.
- To examine, from an environmental, economic and cultural standpoint, the pros and cons of various hive types (fixed-comb, moveable-comb and moveable frame).
- To look at some problems of using Langstroth hives for small-scale development projects.
- To discuss the management options of Langstroth hives commonly overlooked by small-scale beekeepers.
- To name the parts of a hive.
- To examine and demonstrate the use of alternative inputs for a Langstroth system.

RESOURCES

- Small Scale Beekeeping, Chapters 5 and 7.
- Beekeeping in Rural Development, pp. 1-16, 53-61.
- Apiculture in Tropical Climates, pp. 9-37, 181-189.
- Beekeeping Handbook
- The Hive and the Honey Bee, pp. 304-308.
- Attachment 20A, "List of Qualities of Beehives"
- Attachment 20B, "Intermediate Technology in Beekeeping"

MATERIALS

newsprint, markers, Langstroth hive, KTBH, pictures, slides or models of various hive types, labels with the names of hive parts

PROCEDURES

Step 1: **The Bee Space** (20 minutes)

Question the group about what is meant by the "bee space". Point out the application of the bee space in bee hive construction. Demonstrate this using the KTBH, the Langstroth hive and in the spacing of comb within the hive. Point out that the bee space measurement varies among races of bees.

Step 2: **Hive Types - Introduction** (20 minutes)

Demonstrate various types of hives with models, slides or photos. Explain that although they are related, the type of hive used is not necessarily directly correlated with any phase of the bee-human relationship. Mention that the Trainees will need to develop an appropriate beekeeping technology in their future work situations.

Use labels to identify the various parts of a hive. Also use labels in the language which the Trainees will use as Volunteers.

Step 3: **Hives Types - Pros and Cons** (35 minutes)

Refer to the "List of Qualities" developed in Step 2 of Session 18, "Hive Design Criteria and Swarm Boxes" and use Attachment 20A, "List of Qualities of Bee Hives" to guide the Trainees in listing the pros and cons of each hive type. Discuss the environmental, economic and cultural factors which determine the pros and cons of each.

Step 4: **Langstroth Hives in Small-Scale Development Projects** (30 minutes)

Question the Trainees about problems they foresee with using Langstroth hives in development programs. Discuss and demonstrate where possible:

- that a Langstroth "high technology" system demands a high level of expertise in beekeeping to be successful,
- that the bee space must be maintained by using ten frames and the problems encountered by using fewer than ten,
- that poorly made equipment negates many of the advantages of the Langstroth system,
- that the lack of comb foundation may be a problem,
- that the improper use of queen excluders may be using an expensive piece of equipment when it is unnecessary,
- that one-box brood chambers are not utilizing a Langstroth system maximally.

Touch on some commonly overlooked management options in small-scale development projects. Include for discussion:

- exchanging boxes of the brood chamber to expand the brood nest,
- using two boxes for the brood chamber,
- storing drawn comb.

Ask the Trainees for reasons why the beekeeper uses foundation and wire in frames. Elicit suggestions from the group about other options -- such as starter strips and monofilament fishing line.

Trainer Note

○ Let the Trainees know that practice with foundation, starter strips, fishing line and wire will be provided during a "Bee Management Techniques" session.

Step 5: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

Attachment 20A

LIST OF QUALITIES OF BEEHIVES

	FIXED-COMB HIVE	MOVEABLE-COMB HIVE	MOVEABLE-FRAME HIVE
Access to honey comb	often difficult	easy	easy
Access to brood nest for inspection	usually impossible	possible	possible
Exchange and/or replacement of combs	impossible	usually possible	possible
Separation of brood comb from honey comb	impossible	relatively possible	possible
Materials necessary	variable	variable	limited to wood
Possibility of increasing or decreasing space	difficult	possible	very possible
Cost	low	intermediate	high
Carpentry skills and carpentry equipment needed	low	intermediate	high
Potential for management	none	intermediate	high

Attachment 20B

Beekeeping round the world

Intermediate technology in beekeeping

Intermediate technology is a much used term nowadays, for what is intermediate between primitive and advanced technologies, on a world scale. It is of interest for the world's beekeepers since most of them are, in fact, practising intermediate technology in much of what they do.

Straining broken combs to separate the honey and wax is primitive technology, whereas operating a centrifugal extractor by hand (or by bicycle pedals and a chain drive) is intermediate, and using a large powered extractor that takes either frames or complete supers is advanced. Migrating hives of bees on a pack animal—or on the beekeeper's back or head—is primitive technology, hand-loading them on a small truck is intermediate, and using boom or gantry loader with a large truck is advanced.

The movable-frame hive, precision-made and used to its full advantage, must be classed as advanced technology. Intermediate technology here would be represented by the round Greek top-bar hive or the rectangular Kenya top-bar hive, which have movable combs but no frames. They need only one element of precision, the distance between centres of the juxtaposed top-bars, i.e. that between the midribs of adjacent combs. Primitive technology is represented by the many types of traditional fixed-comb hives, made of clay, wood or straw.

In 1965 the late Dr. Ernst Schumacher (who wrote *Small is beautiful*) founded the Intermediate Technology Development Group (ITDG), which is devoted to the promotion and encouragement of intermediate technologies, especially in the poorer developing countries. Its publishing arm, Intermediate Technology Publications Ltd, issues a quarterly journal *Appropriate Technology* which, increasingly, is including information on beekeeping. In 1982 another part of the Group, Intermediate Technology Industrial Services, assisted in the publication of a 60-page booklet *The golden insect : a hand book on beekeeping for beginners*. This comes from the Technology Consultancy Centre at the University of Science and Technology, Kumasi, Ghana. Both top-bar and frame hives are described, but honey is separated from the comb by straining, as the Centre was still waiting for the arrival of modern extractors when the book was written. The distinctions between primitive, intermediate and advanced technologies are very fluid, and vary according to the culture concerned.

The level of technology that is appropriate varies with time, as well as from one culture to another. During the period which 'advanced technology' beekeeping was developed more or less to its present state, several factors were operating that no longer apply:

(*a*) labour was inexpensive and plentiful
(*b*) there was relatively little use of machines powered by electricity or other energy sources
(*c*) wood was inexpensive, plentiful and well seasoned
(*d*) much less was understood about the behaviour of bees and the factors controlling it.

Beekeeping will probably always be labour-intensive (*a*), but for hobbyists who do it for enjoyment, and for rural peasants who have the time available, the labour does not involve outlay of money. The machines (*b*) are used by large-scale beekeepers to whom they represent a saving in labour and hence wages; some hobby beekeepers may be relatively highly mechanized, because they fit their beekeeping into an already over-busy life, and time is more important to them than money.

With regard to (*c*), there is no ready-made answer. The modern hive was based on the ease and cheapness with which wooden parts could be precision-made a century ago. One possible line of development is to move over to plastics, or to some other less expensive suitable material. Another is to adapt the design of hives to some simpler form that still satisfies the requirements of disease control, and this could well be appropriate technology for the present day.

Factor (*d*), the enhanced knowledge we now have of bee behaviour, is likely to be applied first by the more advanced beekeepers who themselves have a good understanding of what is in question. Any consequent developments in bee management must then be adapted for use in intermediate technology, and information about them disseminated where they can be put into use.

In many parts of the world the lot of beekeepers could be greatly improved by raising their level of technology to an intermediate one. In other parts, some beekeepers may be working at an inappropriately high level for present-day costs and for their scale of operation. For every beekeeper there is an appropriate level of technology, and a better development of the intermediate level could benefit those for whom 'advanced' beekeeping is too expensive as well as those to whom 'primitive' beekeeping is too inefficient.

IBRA will be interested to hear about appropriate technical improvements and modifications in beekeeping practices—whether they affect output, economics, or patterns of human social behaviour. Information likely to be suitable for dissemination through the network of the Intermediate Development Technology Group will be passed on to the Group for suitable action.

From: Bee World, Vol. 64, No. 1, 1983.
pp. 43-44.

SESSION 21

OBTAINING BEES

Trainer Note

- ○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.
- ○ Since this is a topic which has two points of view, it may be facilitated effectively by two Trainees with each taking a different side.

TOTAL TIME 2 hours

OVERVIEW A source of bees is a limiting factor in starting beekeeping projects in many areas. Local sources are often unavailable or unreliable, while importing bees presents many problems. This session examines the various ways of obtaining bees and relates those ways to the economic, political and social milieu of beekeepers and development agencies. Exploring this constraint on beekeeping development will better enable Trainees to understand their future roles as beekeeping extensionists.

OBJECTIVES

- To discuss various methods of obtaining bees.
- To examine methods of obtaining bees in relation to the level of technology used by beekeepers.
- To discuss the problems and implications of importing bees from other areas.

RESOURCES

- Small Scale Beekeeping, pp. 93-95.
- The Beekeeper's Handbook, pp. 28-29.
- Beekeeping in Rural Development, pp. 127-143.
- Attachment 21A, "Introduction of Non-Native Bees to New Areas"

MATERIALS chalk, chalkboard, package for shipping bees

PROCEDURES

Step 1: **Methods of Obtaining Bees** (30 minutes)

Ask the Trainees what methods they know for obtaining bees. Explain the various methods and relate each method to the type of hive (level of technology) used. Point out that it is not economically practical to wait for swarms when moveable-frame hives are used. If available, show a package used for shipping bees. Discuss the problems of packaging and shipping bees. Point out that good transportation and communication systems are necessary for the development of a package bee industry.

Step 2: **Importing Bees** (1 hour, 15 minutes)

Present the information in Attachment 21A.

Emphasize the dependency which is often created in a beekeeping project when bees are imported from an outside source. Point out that this is contrary to the Peace Corps philosophy of creating self-sufficiency and that PC/Washington does not support importing bees for a project.

Trainer Note

○ This presentation may take one of several possible forms. It may be a lecture, a debate between either individuals or groups, or a role play (see Session 19, "Role of the Volunteer in Development").

Step 3: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

Attachment 21A

Beekeeping round the World

Introduction of non-native bees to new areas

The world's present honey industry would not exist if honeybees *(Apis mellifera)* had not been introduced from Europe into continents that had no native *Apis*, notably the Americas and Australasia. It is therefore understandable that countries in the tropics just starting to develop their own honey industry look to the introduction of similar bees as a first step towards getting large honey crops. Those concerned may not even realize that they have their own valuable *Apis mellifera* or other *Apis* species. Introducing foreign bees can, however, have a negative result: it may prevent the successful development of apiculture and even destroy what already exists. The subject of introducing exotic bees is thus a very important one.

Whether bees should be introduced from another country

1. **Bees must never be introduced** unless: *(a)* they are completely healthy and without parasites; *(b)* they have no characteristic that is disadvantageous in their use for beekeeping (such as inbreeding, poor performance, unacceptable behaviour characteristics such as 'aggressiveness'); *(c)* the characteristics of native honeybees have been adequately assessed. To these points must be added: *(d)* no combs should ever be introduced, because some diseases can be transmitted by combs; the same applies to used beekeeping equipment. The above criteria must always be followed, in addition to points 2 to 8 below.

2. There is no apicultural objection, subject to restrictions in 1 above, to introducing bees to an isolated area **entirely without honeybees,** such as some Pacific islands.

3. Introduction of European-type *Apis mellifera* into an area **where no honeybees are native,** but where similar bees have previously been introduced (such as Central America), may be permissible. Such introductions may, however, result in hybridization with bees already there, which may or may not be desirable. In no circumstances should new bees be taken to a 'sanctuary' area where previously introduced bees have for some reason been isolated and now form a genetically valuable resource. An example is Kangaroo Island off South Australia, which has purer 'Italian' bees *(Apis mellifera ligustica)* than now exist in Italy or anywhere else[7].

4. Where **native *Apis mellifera* bees exist,** there is danger in importing foreign bees of the same species, because new genes may then contaminate the local gene pool, and a genetic breeding resource may be lost. This may not matter if the bees in the area are already very mixed as a result of many past introductions, but if there are isolated populations, genes valuable for breeding may disappear for ever. This would be true of parts of Turkey or of North Africa.

5. Where there are **native tropical *Apis mellifera*** (as in tropical Africa), any temperate-zone introductions may well not survive, because they lack several adaptations to life in the tropics.

6. **Where *Apis cerana* is native** (in Asia), introducing *Apis mellifera* can have a variety of results[1]. It may lead to the extinction of *Apis cerana;* this process is almost complete in Japan, for instance. Alternatively, competition between the two species may lead to the extermination of *Apis mellifera*, because *Apis cerana* is better at exploiting the local food resources. In other areas both may co-exist.

7. Where **any *Apis* species other than *mellifera* are present** *(cerana, dorsata, florea)*, complications arise with the mating of queens of the introduced bees, because the sex pheromone that attracts drones to a queen is the same for all species. The presence of many drones of other species may prevent drones of the same species getting access to the queen and mating with her.

8. The results of introducing **tropical *Apis mellifera* from Africa** into Brazil in 1956 have been well documented[6]. In no circumstances should tropical African bees, or Africanized bees from America, be introduced elsewhere.

Points to consider if introductions are made

1. Point 1 in list above.

2. Bees should be introduced only under rigid quarantine conditions, and permissions for importations should be granted only to institutions and individuals that can maintain strict adherence to the quarantine requirements. The Director of Animal Quarantine in New South Wales, Australia, has described experimental quarantine procedures used there for imported honeybees[3].

3. Bees should be imported only from countries:
   (a) that are free from serious bee diseases[2], and that have no bees with undesirable genetic characteristics;
   (b) that maintain effective quarantine and disease control programmes;
   (c) that can certify the health status of export shipments.

Pacific islands (including Hawaii) may well be the first choice, then New Zealand, and then certain careful suppliers in mainland USA and Canada.

4. The most common transport of bees is of a young mated queen in a cage with a few accompanying workers. The cage must be destroyed on receipt, and the workers (labelled according to the reference number of the hive into which the queen is introduced) sent to a competent authority for diagnostic examination. Only the queen should be allowed contact with bees or hive materials in the new area.

5. The best available way for introducing bees in bulk is to transport package bees, in new boxes that have had no previous contact with bees.

6. Insufficient information is available for comment on the introduction of productive *Apis cerana* into other tropical countries with less productive *Apis cerana*.

7. Before any major introduction is undertaken, a pilot scheme should be carried out in an area as isolated as possible. The behaviour of the introduced bees under local conditions should be studied; also, if other *Apis* species are present, any robbing, competition in foraging, or other interactions between species should be looked for.

8. As far as is known, adult bee diseases are not transmitted by immature stages of honeybees, and for this reason methods have been worked out for transporting honeybee brood in an incubator, without comb, from one continent to another[4]. Also, without risk of disease transmission, drone semen can be deep-frozen and transported[5], and subsequently used for instrumental insemination of queens.

Successful introductions

Some successful introductions of European-type *Apis mellifera* have been made into territory of other *Apis mellifera* that are not too dissimilar from the native region of the introduced bees. Such importations have been on a large scale, so that hybridization between the wanted and unwanted bees was minimized, and importations have then been constantly repeated. An example is the introduction to Israel of *A. m. ligustica* (Italian bees) to replace the native *A. m. syriaca*, which are 'aggressive' and in other ways not easy to handle, and also not very productive. Dr. Y. Lensky of the Hebrew University of Jerusalem, Israel, has provided the following information:

> Prior to the large-scale replacement of the native *A. m. syriaca*, observations on the introduction of Italian queens into *A. m. syriaca* colonies were made for several years. Introductions were successful when either mated queens or queen cells were placed into small *A. m. syriaca* colonies (2-3 frames covered with emerging workers). But the easiest way proved to be to split Italian colonies and to strengthen them with sealed brood from *A. m. syriaca* colonies.
>
> Hybrid queens must constantly be replaced by Italian queens, because of the influx of *A. m. syriaca* drones across the frontiers with neighbouring countries. To preserve the Italian genes, every year we import several hundred Italian queens from California, USA, and Australia, and distribute these among queen breeders and beekeepers. The replacement of *A. m. syriaca* was achieved here because of the persistant efforts of the beekeepers and of the Extension Service of the Ministry of Agriculture.

Introductions have also been made, and maintained, in certain regions of other countries, including the People's Republic of China, Taiwan, Burma, and Thailand.

Conclusion

The greatest dangers in introducing new bees into an area are:

(a) the introduction of diseases and parasites: European and American foul brood, and acarine and *Varroa* mites, have been gratuitously introduced in this way into various countries, to the lasting detriment of their beekeeping;

(b) the loss for ever of genetic material that could be valuable for bee breeding;

(c) the introduction of unsuitable bees, with a resultant reduction in the productivity of beekeeping.

(d) the possible reduction of populations of native non-*Apis* bees (including stingless bees), through competition for food.

The following have contributed to the above concepts, and I am much indebted to them: Dr. L. Bailey, L. Church, Drs. W. Drescher, J. B. Free, W. E. Kerr, N. Koeniger, H. H. Laidlaw, Y. Lensky, R. A. Morse, H. Shimanuki, G. F. Townsend, G. M. Walton, C. B. Zimarlicki.

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Eva Crane

From: Bee World, Vol. 63, No. 1, 1982.
pp. 50-53.

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SESSION 22

TRANSFERRING COLONIES

TOTAL TIME 8 hours

OVERVIEW Transferring colonies from fixed-comb hives (either wild or rustic hives) is an important method of obtaining bees in many beekeeping development situations. This session will provide experience in both transferring colonies and in transporting hives to new sites. Transferring a colony is often difficult work and is usually traumatic to the colony. Successfully completing a transfer will greatly increase the Trainees' confidence in working with bees.

OBJECTIVES

- To discuss the factors involved in transferring and transporting a hive.
- To observe the social and economic conditions of beekeepers who use rustic hives.
- To transfer bees from a rustic colony to another type colony.
- To transport hives.

RESOURCES

- Small Scale Beekeeping, pp. 100-105.
- Beekeeping Handbook
- The Hive and the Honey Bee, pp. 384-390.

MATERIALS colonies in a rustic hive, smoker and fuel, machete, water, either a KTBH or Langstroth hive, hammer, nails, saw, screen wire, string, knife, bucket, towels

PROCEDURES

Trainer Note

○ In order to provide each Trainee with a chance to participate in this aspect of bee management, have several rustic colonies available. It may be necessary to travel to several places to find a sufficient number of colonies.

○ As dusk is the best time to close colonies for transporting, this session may end later than usual. Explain this beforehand so that, if necessary, the Trainees may make arrangements for being late.

Step 1: **Introduction** (45 minutes)

Have the Trainees describe what they already know about transferring a colony. Be sure they understand the importance of quickly disorienting the colony as much as possible to minimize stinging. A good way to do this is to turn the colony upside down.

Discuss various alternatives in the transferring process and problems which are often encountered. Emphasize that transferring colonies is difficult work and that they should expect to be stung; also explain that it is a great learning experience for practical beekeeping skills.

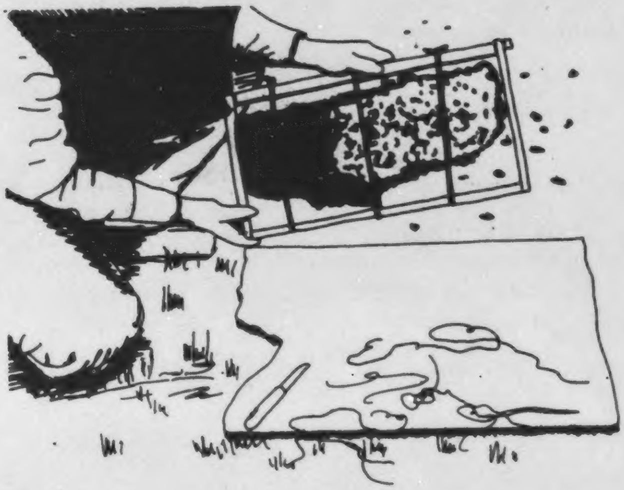
Discuss with the Trainees the procedure and the points to consider when transporting bees.

Have a Trainee take charge of assembling all of the equipment needed to make the transfers.

Step 2: **Transferring and Transporting Colonies** (variable time depending on distance to be traveled)

Have the Trainees make several hive transfers. Move among the Trainees as they are working and offer suggestions. Facilitate observations on the social and economic condition of the beekeepers with rustic hives.

Have the Trainees prepare the colonies for transporting and carry the hives to the new apiary site.



SESSION 23

FAMILY LIVE-IN ANALYSIS

TOTAL TIME 2 hours

OVERVIEW

Many of the Trainee's experiences will be similar while living with families, yet by virtue of being with different families, many of their experiences will also be unique. This session enhances the learning potential of the live-in experience by providing a forum in which the Trainees can share among themselves the results of the live-in. Trainees share information about the community and discuss their feelings about the experience. They assess whether or not they have met their personal goals by sharing specific information about what they have learned. Each Trainee develops a personal plan for continued development of adaptation skills. By reviewing their past experiences, the Trainees will develop individual plans for continuing to improve their adaptation skills.

OBJECTIVES

- To share and analyze feelings related to the live-in experience.
- To evaluate the extent to which personal goals were met.
- To discuss and share new information acquired during the live-in.
- To design a personal plan for continued development of skills for cross-cultural adaptation.

RESOURCES

From Session 2:
- "Introduction to Family Live-in"
- "Lists of Personal Goals"
- "List of Skills to be Practiced and Developed"

MATERIALS newsprint and markers

PROCEDURES

Step 1: **Feelings and Impressions** (20 minutes)

Explain the session objectives and briefly review the procedures. Ask the Trainees to share what happened during the live-in; their general feelings about the experience; and any special problems or highpoints that were encountered.

Step 2: **Personal Goals/Learning Experiences** (60 minutes)

Hand back the "lists of personal goals" which the Trainees developed in Session 2, "Introduction to the Family Live-in". Allow them time to look over the lists. Have them divide into groups of three or four and discuss the following questions:

- Which of your goals were/were not accomplished? Why?
- Did the families accomplish their goals?
- What new information did you learn about the community? Health practices? Beekeeping? Roles of men and women?

When the Trainees return, ask a representative from each group to present a report of the results of their discussion. Encourage questions and discussion among the Trainees. Before proceeding to the next step, ask one of the Trainees to summarize and draw conclusions regarding learning experiences which seemed to have been common within the group. Point out that community analysis techniques will be discussed in more detail prior to and following the scheduled site visits in the fourth week of the program.

Step 3: **Skills Analysis** (40 minutes)

Post the "List of Skills to be Practiced and Developed", which was generated in Session 2, "Introduction to the Family Live-in". Allow the Trainees a few minutes to look it over. Remind them that this is a list of those skills which they felt that they would be practicing and developing during the family live-in. Ask them to briefly discuss which skills they feel they did practice and which skills they did not practice. Have the Trainees use the time remaining in this session to individually review the skill list and develop a written personal plan for how they will continue to work on these skills for the remainder of the program.

Trainer Note

○ The minimum period of time recommended for the family live-in is two weeks. If the Trainees are finding the live-in to be productive and fun, give them the option to continue for the remainder of the program.

SESSION 24

QUEEN REARING

TOTAL TIME 12 hours

OVERVIEW Queen rearing is advanced beekeeping. Successful queen rearing combines a knowledge of bee biology with good beekeeping skills. This exercise allows the Trainees to learn about and practice various queen rearing techniques. The emphasis is on relatively simple methods which are appropriate for the level at which the Trainees will be working. Experience in queen rearing will increase the beekeeping credentials of the Trainees in their future work situations.

While carrying out the queen rearing activities, the Trainees will develop and evaluate extension pamphlets and will present method demonstrations describing the methods used. This will provide the Trainees with experience in preparing written materials and visual aids appropriate for use with small-scale farmers. Such skills will be important in the Trainees' future roles as beekeeping extensionists.

OBJECTIVES

- To examine the principles of queen rearing.
- To plan and assemble the equipment needed for queen rearing.
- To write an extension pamphlet appropriate for use by Peace Corps Volunteers.
- To select frames of brood appropriate for rearing queens.
- To prepare a finishing colony.
- To remove ripe queen cells from the finishing colony.
- To establish mating nucs.
- To present a method demonstration on queen rearing.
- To work effectively in a group.

RESOURCES

- *Contemporary Queen Rearing*
- *The Hive and the Honey Bee*
- *The Social Organization of Honeybees*
- *Development of Hybrid Honey Bees*
- *La Apicultura*: *Guia Practica*, *Como Trabajar con las Abejas*
- Attachment 24A, "Queen Rearing - Beetsma Method"
- Attachment 24B, "Queen Rearing - Miller Method"

MATERIALS

sheets of foundation, screen wire, strips of sheet metal, knife, queen excluder (or 5-mesh hardware cloth), frame with empty comb, two swarm boxes with young bees, several strong colonies, finishing colony, several empty frames, pins, string, mating nuc boxes, colored markers, newsprint, pens, paper, ruler

PROCEDURES

Step 1: **Introduction to Queen Rearing** (1 hour)

Review and elaborate upon the biology of queen production in a bee colony. Relate the various methods of queen rearing to the biology of the bee colony, i.e., that methods of queen rearing are based on artificially creating the conditions of natural queen rearing in the colony.

Explain and discuss the basic guidelines for selecting queen mother colonies.

Step 2: **Defining the Activities** (1 hour)

Outline the basic format of the remaining activities of this session. Explain that the Trainees will divide into two groups and that each group will use a different method to rear queens. One group will use the Beetsma Method and the other will use the Miller Method. Each group will also prepare extension pamphlets and present method demonstrations on the queen-rearing method used. Point out that although the trainers will be available as resources for these activities, the Trainees are responsible for carrying them out.

Outline the reasons for developing an extension pamphlet and discuss the appropriate criteria for the pamphlet. Discuss what audience is being considered and how to meet the needs of this audience. Pass around examples of extension pamphlets for examination and discussion. Explain that the Trainees will critique the pamphlets they write for effectiveness in meeting their specified goals. Make sure that the criteria developed for the extension pamphlets include:

- using simple, concise language
- presenting technical concepts clearly and correctly
- using simple, clear illustrations, which are adapted to the culture of the intended audience.

Point out that method demonstrations will be presented to inform each group about the queen-rearing method used by the other group. Mention that Session 29, "Visual Aids - Queen Rearing Preparation" will provide time to prepare for the method demonstrations. Explain that each group will evaluate the other on their method demonstrations.

Explain that the Trainees are to schedule the activities during the time allotted for this session and during "Bee Management Techniques", if it is needed. Stress the importance of effectively working together to accomplish the tasks. Point out that the pamphlets and method demonstrations must be completed by the last period scheduled for this session.

Trainer Note

○ Attachment 24A, "Queen Rearing - Beetsma Method" and Attachment 24B, "Queen Rearing - Miller Method" are provided as references and as examples of extension materials prepared by Peace Corps Trainees and Volunteers. The illustrations in the original materials are not included.

○ La Apicultura: Guia Practica, Como Trabajar con las Abejas is an example of extension materials developed by Peace Corps Volunteers.

Step 3: **Carrying Out the Activities** (10 hours)

Have the Trainees divide into two groups and carry out the activities outlined in Step 2.

After the method demonstrations, evaluate the design and facilitation of the presentation using the format of Steps 5 and 6 of Session 7, "Bee Colony Cycle". Also, review and comment on the effectiveness of the visual aids used.

Have each group present their extension pamphlet. Help the Trainees to review and comment on the effectiveness of the pamphlet in achieving its purpose and of addressing its target audience. Suggest variations in style or alternative formats, if necessary.

Trainer Note

- ○ Circulate between the groups to troubleshoot any rough spots if they begin to develop. Offer encouragement and advice as needed.

Attachment 24A

QUEEN REARING - BEETSMA METHOD

The Beetsma Method is a simple way for any beekeeper to raise queens.

Materials Needed:
Strong queenless colony (queenless 24 hours)
Frame of empty medium-aged wax comb
Razor blade and/or sharp knife
Frame with removable bars
Wire, string and/or wax
Record keeping materials

PROCEDURES:

Step 1: The object is to find young larvae, 1 to 3 days old. Obtain a frame of larvae of the same age. If this is unavailable, find an empty frame to place into a brood chamber of a strong queen-right colony. This will result in larvae of the same age. All other frames in the colony must be filled to make sure that the queen can lay only in the empty frame.

Step 2: Cut the comb into strips. For ease of cutting, select medium-aged brood comb (not too dark). The strips should be 4 or 5 cells wide and they should contain larvae. Remove one side of the strip to the base of the comb.

Step 3: Take the strip which has been cut in half and attach to top bar. Attach comb by the best available resource, such as wax, string, straight pins. The comb must be firmly attached.

Step 4: Attach bar into an empty frame. Two of these bars may be placed in one frame.

Step 5: Place this frame into a strong queenless colony.

Step 6: Conditions in Queen Rearing Colony.
- no other queen
- no other uncapped brood
- provide nutritious food (honey and pollen)
- keep a diary so that timing is known.

Step 7: Sixteen days after the eggs were first laid the new queens will emerge. It is important to separate queen cells a day before the queens are expected to emerge. If this is not done, the queens will kill each other.

Prepared by Peace Corps Trainees Jeannine Bianco, Clifford Bugg, Kathleen Rodger, Craig Sandlin, Gene Sichta and Tim Stuart.

Attachment 24B

QUEEN REARING - MILLER METHOD

adapted from the original,
in Spanish, by Jean Ana Cummings,
RPCV Guatemala and The Gambia

The Miller Method is a simple way for any beekeeper to raise queens. However, two conditions are necessary for successful queen rearing by the workers in the colony.

1. The Time: a time of year when sunshine is plentiful and when it is neither too cold nor extremely hot.
2. The Flowers: when plenty of "bee plants" are available as forage. Nectar and pollen are necessary food for the workers to raise new queens.

Why is it necessary to raise queens?

Young queens are the strongest and the most productive egg layers and therefore can produce larger field forces under build-up conditions.

It is necessary to raise a new queen when:

1. the queen has died in a colony.
2. the beekeeper has a queen which is failing in a colony.
3. the beekeeper wishes to make new colonies (divisions).

Necessary equipment to raise queens.

1. A strong colony (queen mother colony) with a good queen (the queen mother).
2. A bottom board, a top, two boxes without frames and metal screening to close the entrance. (This equipment is to make up a cell building colony.)
3. A frame without wire with a half sheet of foundation well-pegged to the frame with melted wax.
4. A large feeding bottle with sugar syrup.
5. Ten frames of comb or foundation.
6. Nucs. It is suggested that a number around 10% of the total number of colonies in the apiary be the number of nucs to make up. This allows a number of queens on reserve for future requeening purposes.

Steps to Follow

Step 1

Choose a queen mother from a strong colony. The "Queen Mother Colony" should exhibit as many of the following characteristics as possible:

(a) The workers are gentle.
(b) It produces a lot of honey.
(c) It is disease resistant.
(d) The brood pattern is solid and even.
(e) It does not exhibit a tendency to swarm.

Note: The queen mother colony should have seven to ten frames of brood. Also, it is necessary to have frames of sealed honey and frames of stored pollen to raise a good queen.

Step 2

Put the bottom board and empty box for the cell-building colony on top of a hive stand. Close the entrance with the metal screening.

Step 3

Remove one frame of pollen and one frame of sealed honey from the queen mother colony. Put these two frames into the middle of the empty box.

Step 4

Find the queen in the queen mother colony. Place her in the cell building colony along with a frame of brood (along with the bees on that frame of brood).

Replace the three frames removed from the queen mother colony with frames of foundation.

Step 5

Have a frame, without wire, ready. Put in a half-sheet of foundation. The foundation should be well-pegged to the top of the frame with melted wax.

After this half-sheet is drawn out the queen will lay her eggs on this frame as it is the only place where she will have space available to lay.

Step 6

Shake the bees from four frames of unsealed brood into the cell building colony.

Step 7

Place an empty box on top of the cell building colony. Put the feeding bottle filled with sugar syrup on top of the frames inside this colony. Close this colony with the top.

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Step 8

Three days after establishing the cell building colony, open the entrance of the colony and check to see if all of the sugar syrup has been consumed. Refill if necessary.

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Step 9

Destroy all of the queen cells in the queen mother colony seven days after establishing the cell building colony. Carefully check each frame of brood while looking for the queen cells.

Also, destroy (cut-out) the older (larger) larvae since good queens will not develop from them.

The beekeeper cannot accurately determine the age of the larvae in the queen cells in the queen mother colony. Therefore, it is preferable to use the young larvae (of known age) which will be placed in the nucs to be raised into queens.

Step 10

Remove the frame without wire from the cell building colony seven days after establishing the colony. Carefully brush the bees from the frame. This frame should have only small, young larvae. Care must be taken not to kill the queen while checking this colony.

Find the smallest larvae and cut the comb from underneath those cells. Be sure to cut away all drone cells.

The smallest larvae will produce the best queens. By cutting away the comb from underneath these larvae, the beekeeper is providing enough room for the worker bees to build queen cells.

Note: Although it generally takes seven days after establishing the colony for the larvae to be ready, check the colony after five days as under some conditions the larvae may be ready earlier. Under other conditions, it may take up to ten days before young larvae will be found on the comb.

Put this cut-comb frame into the strong queen mother colony between frames of brood. The worker bees will build queen cells from the young larvae.

Step 11

Fill the cell building colony with frames of comb or foundation so that the queen has space available in which to lay eggs.

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Step 12

Remove the cut-comb frame from the queen mother colony ten days after placing it in the colony (Step 10).

Sealed queen cells should be apparent. Carefully brush away the bees. Never shake or turn queen cells on their sides!

Carefully cut around the queen cells. Allow room around the cell so that the cutting in no way disturbs the developing queen.

Cut out from a frame of brood an area equivalent to the size of the queen-cell comb. Press the comb surrounding the queen cell into the comb on the frame of brood. Be sure that the queen cell is fixed firmly on the comb.

Put this frame with the queen cell into a queenless nuc.

Step 13

Unite the cell building colony with the queen mother colony.

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Step 14

Check the queen-mating nucs to see if the queen is laying two weeks after introducing the queen cells.

SESSION 25

HEALTH AND HYGIENE

TOTAL TIME 2 hours

OVERVIEW

Personal health and hygiene issues are often serious concerns among Peace Corps Volunteers when they are beginning to live abroad. This session reviews hygiene practices which Trainees will need to follow when they are at their sites. Principles of primary health care discussed include the nature of diseases and common illnesses; how they are transmitted; and how they can be prevented or controlled. The session also examines ways in which the Trainees can maintain their personal health while serving as role models for appropriate health care practices in their sites.

OBJECTIVES

- To define and describe basic hygiene and sanitation techniques.
- To identify major causes of diseases.
- To identify diseases common to the areas in which the Trainees will be working.
- To discuss the prevention, transmission and treatment of these diseases.
- To examine the role of the Volunteer as a health promoter.
- To discuss measures which Volunteers can take to protect their personal health.

RESOURCES

- Where There Is No Doctor, pp. 131-150.
- The Personal Health Training Manual, p. 95.
- Transcultural Study Guide, pp. 129-142.
- Community, Culture and Care, pp. 173-186, 209.
- Handout 25A, "Causes of Infectious Disease"
- Handout 25B, "List of Major Diseases in Africa and Latin America"
- Handout 25C, "Health and Hygiene Information Packet"

MATERIALS newsprint and markers

PROCEDURES

Step 1: **Causes of Disease** (20 minutes)

Begin by briefly outlining the procedures of the session and explaining the objectives. Have the Trainees brainstorm and list, on newsprint, the health and hygiene problems that they have seen, either at the training site or in the surrounding area. Ask them to discuss how this might be different in their countries of assignment as Peace Corps Volunteers. Have the Trainees generalize from this list by identifying and describing factors in the environment that can cause illness. This list should include such factors as: disease vectors, customs, habits, climate, geography, economic status, education, industrial pollutants and contaminated water. Distribute Handout 25A, "Causes of Infectious Disease" and allow time for reading. Invite comments and answer any questions.

Step 2: **Transmission and Treatment** (20 minutes)

Have the Trainees name communicable/contagious diseases which might be caused by the factors and problems listed in the previous step. Distribute Handout 25B, "List of Major Diseases in Africa and Latin America". Allow the Trainees time to look over the material. Give a brief talk on the causes and transmission of diseases. Identify modes of transmission, causes and general treatments for the major regional diseases listed. Invite comments and questions. Elicit information from the Trainees based on any personal experiences with any of the diseases.

Discuss how cause and transmission are similar in human diseases and bee diseases. Mention that bee diseases will be discussed in detail in Session 46, "Bee Diseases and Pests".

Discuss the role of bees, honey and beeswax as medicinal agents. Ask the Trainees to cite any examples of the use of honey in preventative and curative health which they have observed. Help to stimulate responses from the Trainees by mentioning such uses as:

- bee stings for arthritis
- honey as a topical bacteriostatic ointment
- honey for coughs
- beeswax and aloe burn ointment.

Step 3: **Disease Prevention** (30 minutes)

Introduce aspects of coping with one's own health problems while living overseas. Ask the Trainees to briefly describe any steps they have taken to avoid or correct potential health problems. Encourage discussion and the sharing of ideas. Distribute Handout 25C, "Health and Hygiene Information Packet". Allow reading time. Point out that the Trainees can use the information in the packet as a basic reference guide throughout their service as Volunteers. Answer any questions regarding the handout.

Trainer Note

○ If Where There Is No Doctor is available as a text or as a reference book, recommend that the Trainees read pages 131-150. Point out and stress the value of this book as an effective guide to the basic prevention and treatment of diseases in developing countries.

Step 4: **Role of the Volunteer in Health Promotion** (40 minutes)

Have the Trainees discuss the extent to which Peace Corps Volunteers take a role in promoting good health in their communities. Explain the role-model effect of Volunteers in a community and how their behaviors are often considered examples of good health practices.

Divide the Trainees into three groups. Have them work together to prepare and present a short role play. Assign each group one of the following role play situations:

- a Volunteer attempting to change an improper health/sanitation practice in a community;
- a Volunteer attempting to help a host country national who is ill;
- a Volunteer who is ill and attempting to decide whether or not to accept a traditional treatment.

Point out that in their role plays the Trainees should present the cause, prevention, symptoms and treatment of at least one of the diseases discussed earlier in the session.

Following each role play, briefly discuss each situation and the points which were brought out. Center the discussion around such points as:

- whether or not proposed preventative and curative steps could be realistically achieved;

- what specific cultural, economic or environmental factors influenced the existence of the disease;
- what Volunteers can do to promote their own personal health.

Step 5: **Summary and Conclusion** (10 minutes)

Conclude the session by reviewing the objectives and asking the Trainees to provide feedback regarding how well they were met. Answer any final questions regarding health and hygiene. Point out that, although health conditions in many developing countries may appear quite hazardous, most Peace Corps Volunteers can remain healthy throughout their two years simply by following basic hygiene practices and availing themselves of the medical services of the Peace Corps Office.

safe
drinking
water

Handout 25A

Causes of Infectious Disease

Viral

A virus is the smallest organism that causes disease. It is classified between living and non-living matter. The body can become immune to viral disease through antibodies, either produced in the body or introduced by means of immunization (vaccination). Some diseases caused by viruses are: common cold, flu, chicken pox and shingles, smallpox, polio, herpes, measles and pneumonia. Many viral illnesses are self-limiting and almost all viral infections do not respond to antibiotics.

Bacterial

These organisms are classified somewhere between animal and plant and are responsible for a wide variety of illnesses. Not all bacteria are pathogenic and many are necessary for good health. Some diseases of bacterial origin are: tuberculosis, typhoid fever, shigella, venereal disease, tetanus, leprosy and yaws. Antibiotics are appropriate for bacterial infections. However, they kill many types of bacteria and may cause an imbalance, thereby, leading to another type of infection (yeast). The body produces antibodies as well. Bacteria may be controlled with disinfectants and antiseptics.

Fungal

The fungus reproduces with spores and often appears as a skin disease. Examples of fungal diseases are ringworm, athlete's foot, jock itch and certain ulcers.

Protozoan or Parasitic

These are simple animals that cause illness either from within the body (e.g., amoeba, giardia, hookworm, tapeworm and roundworm) through the fecal-oral route of transmission or from outside the body, as in insect bites or direct contact with the parasite. Some other examples include scabies, malaria and river blindness.

Handout 25B

List of Major Diseases in Africa and Latin America

The following are some of the diseases which are found in Africa and Latin America, categorized in terms of how they are transmitted.

	Africa	Latin America
Vehicle borne: (water, food, fomites/ inanimate objects):	Schistosomiasis	Typhoid fever
	Amoebic dysentery	Tapeworm
	Hepatitis	Roundworm
	Tapeworm	Giardiasis
	Round worm	Amoebic dysentery
	Typhoid fever	Hepatitis
	Cholera	Cholera
	Giardiasis	Fungus
	Shigellosis	Shigellosis
	Tetanus	Tetanus
Vector borne: (flies, mosquitoes, other insects)	Malaria	Leishmaniasis
	Trypanosomiasis*	Trypanosomiasis*
	Filariasis	Hemorrhagic fever
	Onochocerciasis	Malaria
		Yellow fever

* Also known as Chagas' disease

Direct Contact	Scabies*	Scabies*
	Syphilis*	Syphilis*
	Gonorrhea*	Gonorrhea*
	Herpes*	Herpes*
	Leprosy	Leprosy
	Trachoma	Trachoma
	Yaws	Yaws
	Hookworm	
	Conjunctivities	

* Sexually transmitted

Animal borne:	Rabies	Rabies
Air borne:	Tuberculosis	Tuberculosis

Taken from OPTC Basic Health Training Guide (Draft)

Handout 25C

Health and Hygiene Information Packet

Basic Guidelines for Personal and Dental Health

1. Always wash your hands with soap when you get up in the morning, after having a bowel movement and before eating.

2. Bathe often -- every day when the weather is hot. Bathe after working hard or sweating. Frequent bathing helps prevent skin infections, dandruff, pimples, itching and rashes. (Where water sources are limited, learn to conserve water. Take frequent sponge baths. Be sure not to contaminate your safe water supply. Pour the water you'll need into another container for use.)

3. In areas where hookworm is common, do not go barefoot. Hookworm infection causes severe anemia. These worms enter the body through the soles of the feet.

4. Brush your teeth at least once a day and, if possible, after every meal. If brushing is not possible for some reason, rub your teeth with salt and baking soda. (See Where There Is No Doctor, Warner, David, p. 230.)

5. Ideally, being able to run a strong thread or dental floss between your gums and teeth is good. If this is not possible, toothpicks or sharpened sticks can be helpful.

6. If children or animals have a bowel movement near your house, clean it up as quickly as possible.

7. Hang or spread sheets and blankets in the sun often. If there appear to be bedbugs, pour boiling water on the bed and wash the sheets and blankets.

8. Beware of dogs and cats from outside. Don't let them into your house. They can carry fleas and other insects which can cause disease.

9. Try to clean your house often. Sweep and wash the floors, walls and beneath furniture. Fill in cracks and holes where roaches, bedbugs and scorpions can hide.

10. Ideally, all water that does not come from a pure water system should be boiled before drinking. This is especially important when there appear to be cases of typhoid, hepatitis, cholera or diarrhea. Water from holes or rivers, even when it looks clean, may spread disease if it is not boiled or disinfected before use.

Taken from OPTC Basic Health Training Guide (Draft)

11. Try to store foods in insect- and rodent-proof containers to prevent contamination. Keep food covered.

12. The common use of human feces for fertilizer makes it necessary to kill intestinal pathogens which may be on foods, such as fruits and vegetables. A disinfectant such as chlorine or iodine will kill these organisms.

13. Use clean cooking utensils and dishes. They should be washed with hot water and soap, air dried in the sun, if possible, and stored in a clean dry place. It is especially important to use hot water and soap when washing dishes used by a sick person so that germs will be killed and not passed on to healthy people.

14. Only eat meat that is well-cooked. Be careful that roasted meat, especially pork, does not have raw parts inside. Raw pork can carry the organisms responsible for the disease trichinosis.

15. Be careful of food that is old or smells bad. It may be poisonous. Don't eat canned food if the can is swollen or squirts when opened. Be especially careful with canned fish.

16. Pay attention to your diet. Good nutrition helps protect the body against many infections.

17. If you smoke cigarettes, try to quit. Put your energy into something healthier and more constructive.

18. Try to get some kind of daily exercise like walking, doing calisthenics, bicycle riding or other activities in which you use your heart and lungs.

Guidelines for Purifying Water

1. Boiling

In this method, water is allowed to boil for fifteen minutes after the first bubbles appear. It is important to follow this procedure because the process is dependent on both heat and time. Some organisms will be killed at high temperatures but only after exposure to that temperature for a certain period of time.

Once the water has been boiled, a pinch of salt can be added to improve the taste.

Boiled water should be stored only in disinfected, covered containers with a tap for dispensing water to avoid contamination. A cup should never be used to remove boiled water from a container.

One problem with boiling water is fuel. In many places, the only available fuel is wood, which can be expensive. In addition, the excessive cutting of trees contributes to soil erosion, which may lead to flooding. Where possible, other fuels should be used. One such alternative fuel is gas that is produced from animal manure (buffalo, cow, pig). This fuel is called biogas.

2. Chlorine

Chlorine compounds render water safe to drink if the chlorine is added in the proper amounts and if the water is allowed to stand for 30 minutes before drinking. The amount of chlorine to add depends on the compound used and the condition of the water. Ordinary household bleach is an excellent source of chlorine.

Cloudy water contains organic matter which will combine with the chlorine, taking it away from its intended use as a disinfectant. The usual procedure in this instance is to double the dosage as indicated in the table below. The stronger chlorine compounds require proportionately less chemical to disinfect.

Dosage of Bleach Solution with 5% Active Ingredient

Amount of Water	Clean Water	Cloudy Water
1 liter	2 drops	4 drops
4 liters	8 drops	16 drops
11 liters	1/4 teaspoon	1/2 teaspoon

3. Iodine

Another excellent chemical used for disinfection of drinking water is iodine. This is commonly available as 2% tincture of iodine which can be purchased at any pharmacy. The usual dose is five drops of iodine for every liter of clear water. The dose is doubled for cloudy water, although it is better to first filter the water. Once treated, water should be allowed to stand for 30 minutes before use.

All disinfected water should be stored in a disinfected container complete with a lid and top. Care should be used in handling the iodine solution because of its staining properties.

Basic Information Concerning Solid Waste and Excreta Dispoal

1. Solid Waste Disposal

Our primary concern about solid waste is its proper disposal. Improperly disposed of waste attracts rodents and insects, contaminates water and air, increases fire hazards, creates unpleasant odors and causes the area to look unattractive.

Insects will always be with us but we can reduce our exposure to them by taking simple, yet effective steps. Insects require food to live and most require a moist habitat to breed. Many types of solid waste, especially garbage, provide these two items. We are most concerned about flies due to their ability to transmit organisms from an infected source to humans. If solid waste is disposed of properly, the fly will have to search elsewhere for its food and breeding area.

Some ways in which to dispose of solid waste include:

A. Burning combustible garbage. However, the main problem with this practice is that the solid waste is never fully incinerated. Besides the residue of ash, many of the items in the waste will be found intact. This applies not only to plastic or metal, but also to garbage. If the garbage is not fully burned, it retains its lure to our public health enemies, the rat and the fly.

B. Burying solid waste. Garbage that cannot be burned should be buried in a special pit or place far away from houses and the places where people get drinking water (Where There Is No Doctor). These wastes should be buried and covered with at least 45cm (1-1/2 feet) of earth.

C. Recycling.

D. Composting organic material.

2. Excreta Disposal

There are many different ways to dispose of excreta, and, to be effective, they all should adhere to the following requirements:

A. The surface soil should not be contaminated.

B. There should be no contamination of ground water that may enter springs or wells.

C. Excreta should not be accessible to flies or animals.

D. There should be freedom from odors or unsightly conditions.

E. The method used should be simple and inexpensive in construction, operation and maintenance.

F. Use the excreta for agricultural or other uses only after it has been treated.

G. In the installation of excreta disposal facilities, a safe distance from water sources should be maintained (at least 30 meters or 96 feet).

The most common type of excreta disposal system found in rural areas is the pit privy. It is composed of a hand-dug pit over which is placed a squatting plate or slab. A shelter is usually constructed around this. The pit privy is a minimum-cost solution providing for defecation with or without water use, excreta storage, digestion of waste solids and seepage of urine and moisture into the surrounding soil. Once full, within 50cm (2 feet) of the top, it should be filled in and another pit used. After nine to twelve months, the old pit may be uncovered and the sludge remaining used for fertilizer. It takes this time for all pathogenic organisms to die. Once emptied, the old pit can be used again.

The location of the privy is important. Place it downhill and maintain a distance of at least 30 meters from a water source, unless the well is very deep (30 meters or more). The size is also important. Ideally, pit privies should be designed to have at least four years storage capacity. The sludge volume for a dry pit (one which does not penetrate groundwater) is 40-60 liters (approximately 10-15 gallons) per person per year. Due to the digestion of sludge which takes place in the pit and the percolation of liquid into the soil, the actual volume of material may be reduced to 20% of the total volume of feces and urine deposited. A pit, 2.5 meters (8-1/2 feet) deep and 90cm (3-1/2 feet) square should serve a family of six for five years.

Guidelines for Assuring Foods are Clean

Some illnesses are caused by unclean foods which carry disease-causing organisms. The most common ways that illnesses are spread and can be prevented are listed on the following page:

Foods Usually Involved	Ways to Prevent Spread by Food
Raw fruits and vegetables contaminated by dust, flies, water, soil, night soil fertilizer.	Wash thoroughly with Lugol's Solution (see explanation following): remove peels; cook thoroughly if possible.
Raw or undercooked meats and meat products	Cook these foods thoroughly. Cook garbage fed to swine. Get rid of rats in hog lots.
Cracked or dirty eggs contaminated with poultry excreta, meat meal, bone meal, or fish meal. Poultry meat contaminated by unsanitary handling.	Use only clean eggs with sound shells. Soiled eggs should be washed. Handle poultry meat and eggs under clean conditions. Store them in a cold place. Cook thoroughly and refrigerate if not eaten at once. After handling eggs or poultry, wash your hands thoroughly.
Home canned foods, or sometimes commercially prepared foods.	Cook canned meat and vegetables thoroughly before serving. Boil 15 minutes and stir to make sure you heat all parts.
Moist or prepared foods, milk or other dairy products or water contaminated with excreta.	Strict personal cleanliness in food preparation; keeping moist foods cool during storage periods; cooking foods before serving; getting rid of flies. Persons with dysentery should not handle food. Dispose of human wastes safely.
Raw contaminated milk, dairy products or meat.	Get rid of brucellosis from live stock by vaccinating young animals and slaughtering infected older animals. Boil milk used to drink or to make other dairy products.
Milk contaminated by humans with illness.	Make the milk safe by boiling. Search for the person carrying the illness and isolate them from other people.
Foods contaminated by a discharge from the mouth or nose of a person who has disease germs in his or her body, about to get sick or is immune.	Boil milk used for drinking or to make other dairy products. Keep persons with the disease from handling food. Separate them from other people.

Lugol's Solution

This is an iodine compound which is an effective disinfectant and is available at most pharmacies. The solution should contain 5% iodine or 50,000ppm when purchased. It should be kept in a brown glass bottle. (Light, in the presence of air, will destroy the iodine very rapidly if it is kept in a clear glass container. The concentration will decrease in a brown bottle also, but much slower.) Lugol's should prevent a bright light from passing through the bottle and solution; a person should not be able to see the bottom of a tablespoonful of Lugol's when held in a brightly lit room. If these two criteria aren't met, then the Lugol's is weak and the amount used must be increased.

If using Lugol's, the following dilution schedule should be followed:

1. If Lugol's Solution appears dark and is used within one month of the date of purchase, add five tablespoons to every four liters of water.

2. If Lugol's Solution appears dark brown and is not used within one month of the date of purchase, increase the amount by one tablespoon per month after the first month of purchase. For example, during the first month after purchase, use five tablespoons and during the second month use six tablespoons.

3. If Lugol's allows light to pass through it, do not use it. Purchase a good bottle.

4. Always allow vegetables a contact time of 20 minutes with "good" Lugol's. Keep it in a cool, dark place.

   Note: Household bleach or chlorox (5% active ingredient) can also be used to disinfect vegetables.

General Guidelines for Purchasing, Storing, Preparing and Serving Food

When you purchase, prepare and serve food, it is important to:

1. Select good quality food. Food should smell fresh, come from a clean source, be protected from flies and dirt and have a fresh attractive look and color.
2. Keep yourself clean.
3. Keep dishes and equipment clean.
4. Keep the cooking and eating area clean.

Food can become unsafe to eat if it is:

1. Served by a person carrying disease germs.
2. Served in dirty dishes.
3. Eaten with dirty utensils and/or hands.

Keep everything clean. Cleanliness helps to keep away disease germs. Clean food is likely to be safe food. When cooking foods:

1. Store prepared foods for a very short time.
2. Prepare in clean containers.
3. Cook thoroughly.
4. Serve immediately.
5. Don't save leftovers unless you can put them in clean, covered containers in a cool place.

Immunization

Vaccines are special "medicines" which if administered properly can prevent some diseases. We call this process immunization.

Immunization: Immunity and Antibodies

If you had whooping cough as a child, you only contracted it once because your body became immune to it. The body produces certain antibodies which are special proteins found in the blood. These antibodies fight the organisms that cause disease or the toxins (poisons) that organisms make. Antibodies attach themselves to an organism and kill it off or they attach themselves to toxins and stop them from causing harm. The antibodies which fight toxins are called antitoxins. A different kind of antibody fights each organism or toxin. For example, measles antibodies only fight measles virus. They have no effect on malaria. Antitoxins against tetanus are not helpful against diptheria.

While a child is ill with measles, the body begins to produce the special antibody against the measles virus. The body continues making this antibody; thus the child becomes immune and never has measles again. When the body makes its own antibodies, it has an active immunity. The body becomes actively immune in two ways, either from a disease itself, or from a vaccine.

Vaccines are grown from harmful organisms and then either killed (dead vaccines) or made weak (live vaccines). Because the organisms in a vaccine are weak or dead, they cause no harm beyond what may be mild symptoms (such as a mild fever). When the vaccine is given, the body produces antibodies against the particular organisms, thus preventing the body from becoming ill from the disease itself. When disease makes the body immune, it has a natural active immunity. If vaccine is given to make the body immune, it has an artificial active immunity.

Active immunity is the best kind because it allows the body to continue producing its own antibodies. The only problem is that it may take several weeks or longer before the body becomes immune. If necessary, the body can be made immune immediately by injecting antibodies from another person or animal. These antibodies give the body a passive immunity for a relatively short period of time (usually about two weeks).

The body can receive natural passive immunity while still in its mother's uterus. The antibodies and antitoxins are present in the mother's blood and are passed to the child's blood before birth. At birth, the child is immune to the same disease as the mother.

Natural passive immunity explains why children do not usually have certain diseases until they are about three months old. By this age, most of the antibodies they were given at birth from their mothers have gone. By injecting new antibodies from an immune person or animal, we can give the body an artificial passive immunity. For example, we can inject tetanus antitoxin into an injured person who might have tetanus bacteria in his wound. The antitoxin makes the body immune immediately, before the body has had time to make its own antitoxin. The injected antibodies or antitoxin are soon destroyed, giving the body artificial passive immunity for not more than a couple of weeks.

It is important to remember that live vaccines die easily and become useless. Therefore, care must be taken in the transport and storage of such vaccines. The same is true of dead vaccines though to a lesser extent.

Examples of live and dead vaccines:

Live vaccines	Dead vaccines
BCG (against TB)	Diptheria
Polio	Whooping cough
Measles	Tetanus
	Tetanus toxoid

The following is a representative list of some of the most frequently used immunizations. The actual selection may vary from one volunteer to another and from one country to another, depending on regional considerations, local government guidelines and changing circumstances. For example, a local outbreak of measles or cholera might mean immunizations for everyone.

Each Volunteer has the responsibility to make sure that their individual immunization records are kept up-to-date during their Peace Corps service.

Type	Vaccine Live/Dead	Immunity Active/Passive	Timetable
Yellow Fever	Live	Active	10 years
Diptheria-Tetanus	Dead	Active	Booster
Cholera	Dead	Active	6 months
Gamma Globulin	Dead	Passive	3-6 months
Rabies	Dead	Active	2 years
Polio	Live	Active	Booster
Typhoid Fever	Dead	Active	1, in USA 1, one month later 1, three years later

SESSION 26

SWARMING, SUPERSEDURE AND ABSCONDING

Trainer Note

- ○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.
- ○ Note that this session is related to Session 28, "Constructing a Swarm Board and Swarms", which is also Trainee-facilitated. Suggest that the same Trainee facilitate both sessions.

TOTAL TIME 2 hours

OVERVIEW Swarming, supersedure and absconding are behavioral responses of the colony to changing environmental conditions. As such, the beekeeper employs various management techniques to control or utilize these responses to meet specific hive or apiary needs.

The beekeeper needs to recognize the differences between swarming, supersedure and absconding and to understand the conditions which trigger these responses. With this understanding, beekeepers can appropriately manipulate the colony to achieve management objectives.

OBJECTIVES

- To define swarming, supersedure and absconding.
- To examine why bees swarm, supersede and abscond.
- To discuss indicators of swarming, supersedure and absconding.
- To present the management techniques to control swarming, supersedure and absconding.
- To look at the advantages and disadvantages of swarming in relation to the type of hive used.

RESOURCES

- Small Scale Beekeeping, pp. 42-43, 96-100, 210-211.
- The Social Organization of Honeybees, Chapter 6.
- The Hive and the Honey Bee, pp. 241-244, 345-348, 377-384.
- The Beekeeper's Handbook, pp. 73-82.
- Beekeeping in Zambia

MATERIALS newsprint, markers, tape, blackboard, chalk, a hive and frame of comb (without bees)

PROCEDURES

Trainer Note

○ Prepare the visual aids for Step 2 prior to beginning the session.

Step 1: **Defining Swarming, Supersedure and Absconding** (20 minutes)

Question the Trainees concerning the differences between swarming, supersedure and absconding. List the general characteristics of each and draw simple diagrams to indicate where on a comb the queen cells would occur.

Step 2: **Cause of Swarming, Supersedure or Absconding** (40 minutes)

Write, on strips of newsprint, environmental factors and conditions within the colony which cause or indicate swarming, supersedure and absconding. Hand these strips out to the Trainees and write the words "swarming", "supersedure" and "absconding" across a blackboard. Have the Trainees post the strips under the appropriate heading and discuss their reasons for doing so. Point out that each of these phenomena are caused by a complex of factors rather than isolated factors.

Step 3: **Management Techniques** (30 minutes)

Using an empty hive and frames of comb, demonstrate the conditions of swarming, supersedure and absconding. Question and discuss with the Trainees the management options which might be utilized to control the situation.

Step 4: **Advantages and Disadvantages of Swarming** (15 minutes)

Discuss the advantages and disadvantages of swarming appropriate to the beekeeping system employed. Include such factors as attitude of the beekeeper, the equipment and the race of the bee.

Direct the discussion towards the concept of using swarm boxes to capture swarms. Discuss this as a form of bee-having.

Step 5: **Session Evaluation** (15 minutes)

Trainer Note

- ⬡ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

SESSION 27

CULTURE SHOCK

TOTAL TIME 2 hours

OVERVIEW Culture shock is the occcupational hazard of overseas living. One must go through it in order to have the pleasure of experiencing another culture in depth. This session helps Trainees identify and practice skills necessary to avoid a difficult transition.

OBJECTIVES

- To define culture shock.
- To identify various types of stress.
- To list personal signs or symptoms of stress.
- To develop personal plans for coping with stress in the future as Peace Corps Volunteers.

RESOURCES

- Survival Kit for Overseas Living, pp. 62-68.
- Community, Culture and Care, pp. 173-186.
- Helping Health Workers Learn

MATERIALS newsprint, markers, pens and paper

PROCEDURES

Trainer Note

○ Prior to beginning this session, write on newsprint a comprehensive definition of culture shock (see Step 1). An effective definition is: "The experience of encountering ways of doing, organizing, perceiving or valuing things which are different from yours and which threaten your basic, unconscious belief that your enculturated customs, assumptions, values and behaviors are "right". It is cumulative. It builds up slowly, from a series of small events which are difficult to identify" (Survival Kit for Overseas Living, p. 63).

○ Also, write on newsprint a list of symptoms or signs of severe cases of culture shock (see Step 2). An example of such a list is found in Survival Kit for Overseas Living, p. 65.

Step 1: **Definition of Culture Shock** (15 minutes)

Ask each Trainee to write down a common sense, non-dictionary definition of culture shock. Encourage Trainees to share their definitions with one another. Post on newsprint a comprehensive definition of the term and compare it to the Trainees' definitions. Point out that culture shock is a result of accumulated stress and can be a positive step in the adjustment process. Solicit examples of Trainees' previous experiences in other cultures in which they may have experienced uncomfortable or unfamiliar situations.

Step 2: **Signs of Stress** (45 minutes)

Having emphasized culture shock as a form of accumulated stress, divide the Trainees into three groups and have them identify and list:

- stresses which they have felt at the training site and in the surrounding community,
- stresses which they expect to be under in their sites as Peace Corps Volunteers and,
- personal signs or symptoms of these stresses.

When the groups have finished, have them report back and share their lists. Post the prepared list of culture shock symptoms and compare it with the Trainees' lists.

Homesickness
Boredom
Withdrawal
Need for excessive amounts of sleep
Compulsive eating
Compulsive drinking
Irritability
Excessive cleanliness
Marital stress
Family tension and conflict
Chauvinistic excesses
Stereotyping of host nationals
Loss of ability to work effectively
Unexplained fits of weeping
Physical ailments (psychosomatic illnesses)
• Survival Kit for Overseas Living p. 65

Step 3: **Coping with Stress** (45 minutes)

Ask the Trainees to individually list personal stabilizers or coping devices which they use to help deal with stress. Then have them return to their three small groups and divide their stabilizers into the following three categories:

- those which they will be able to continue to use in their sites as Peace Corps Volunteers,
- those which they will need to modify in order to use and
- those which they will not be able to use.

Have the Trainees report back and discuss the results of their group work. Focus the discussion on defining positive stabilizers which will be helpful to them as Peace Corps Volunteers.

Step 4: **Summary and Conclusion** (15 minutes)

Ask one of the Trainees to volunteer to review and summarize the major conclusions of the session. Refer to the objectives and briefly discuss how well they were met. Make the point that once one has substituted and/or accepted new "everyday things" available in the host-country culture, one may have overcome culture shock.

Also, briefly discuss the importance of such stress management techniques as: peer support systems, counseling strategies, continued information gathering and host-country national friendships.

SESSION 28

CONSTRUCTING A SWARM BOARD AND SWARMS

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 6 hours

OVERVIEW A swarm board is a simple piece of equipment useful for making and observing artificial swarms. A swarm board allows a beekeeper to observe a swarm and its efforts to select a new hive site. A beekeeper can also gain experience in hiving a swarm from a swarm board. This session gives the Trainees an understanding of colony swarming behavior by making an artificial swarm, observing it and then hiving it. Trainees will also make bee beards which are good "attention getters" for Bee Fairs and other extension exhibits.

OBJECTIVES

- To construct a swarm board.
- To practice/acquire carpentry skills.
- To create an artificial swarm.
- To observe and discuss the nature of bee hives.
- To hive a swarm.
- To make a bee beard.

RESOURCES

- Small Scale Beekeeping, pp. 42-43, 96-100, 210-211.
- The Hive and the Honey Bee, pp. 241-244, 345-348, 377-384.
- The Beekeeper's Handbook, pp. 73-82.
- Beekeeping in Zambia
- The Dancing Bees
- The Social Organization of Honeybees, Chapter 6.
- Bait Hives for Honey Bees

MATERIALS wood, nails, hammers, saws, tape measure, hardware cloth (big enough for bees to pass through), rope or wire, two queen cages, tin snips, sugar water, water sprayer, newsprint, markers, bait hives, two colonies of bees, various colors of fast-drying paint

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PROCEDURES

Trainer Note

○ Steps 1 through 3 are scheduled in the afternoon as this time is best for making artificial swarms. Steps 4 through 8 are scheduled for the following day.

Step 1: **Introduction** (30 minutes)

Have the Trainees speculate as to the design and use of a swarm board based on what they have learned in Session 26, "Swarming, Supersedure and Absconding". Explain the details of a swarm board and how it is used to create an artificial swarm. Also discuss the use of bait hives (often called swarm boxes). Touch on the parameters of location, dimension, shape and orientation.

Step 2: **Constructing Swarm Boards** (40 minutes)

Have the Trainees divide into groups of approximately six Trainees each and have each group build a swarm board.

Trainer Note

○ Note that plans for a swarm board are in Small Scale Beekeeping.

○ Circulate between the groups to offer suggestions where appropriate.

Step 3: **Making an Artificial Swarm and Setting Up Bait Hives** (1 hour)

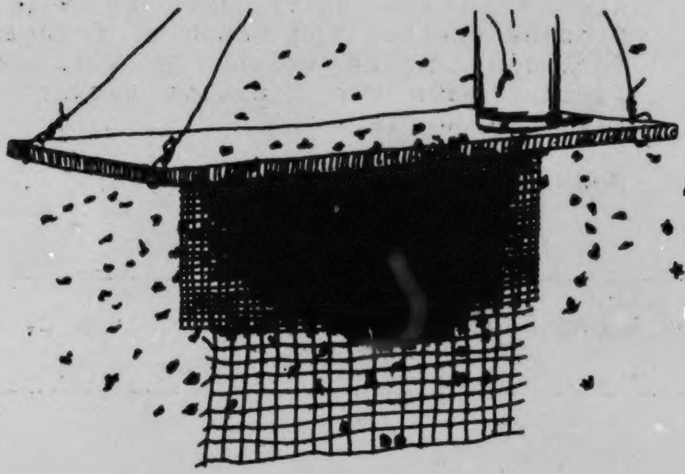
Have the swarm board construction groups each make an artificial swarm and hang it in an accessible site for observation. Before starting, discuss how to correctly cage a queen and have the Trainees practice with drones until they feel confident. While the bees are clustering, have the Trainees set up some bait hives in various locations.

Step 4: **Observation of the Swarms and Bait Hives**
(40 minutes)

Have the Trainees feed the swarms by spraying them with sugar water. Facilitate a discussion of the behavioral activities of swarming while the Trainees are observing the swarms.

Have the Trainees move bees in the swarm about with their fingers to demonstrate how docile the bees are while in a swarm.

Have the Trainees observe whether scout bees have located the bait hives set up the previous day. Mark scout bees with paint and observe their behavior when they return to the swarms.



Step 5: **Swarming Differences Between European and African Bees**
(20 minutes)

While observing swarming behavior, discuss with the Trainees the behavioral differences between swarms of European and African bees.

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Step 6: **Bee Beards** (2 hours)

Elicit suggestions from the Trainees on how to make bee beards using the knowledge they have acquired about swarms and swarming behavior. Have Trainee volunteers make bee beards. Point out that making a bee beard is an effective publicity ploy by which to demonstrate how a knowledgeable beekeeper can manipulate bee behavior.

Step 7: **Hiving the Swarms** (35 minutes)

Using "open-ended" questions, list what supplies need to be in a hive about to receive a swarm of bees. Make sure that the Trainees have placed eggs, brood, pollen and honey in the hives. Caution the Trainees not to put more brood in the hive than the swarm will be able to care for. Discuss whether the scout or forager bees will be included in the colony or will be lost in the field. Have the Trainees prepare the hives and hive the swarms.

Step 8: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

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SESSION 29

VISUAL AIDS – QUEEN REARING PREPARATION

TOTAL TIME 4 hours

OVERVIEW

Communicating information and transferring technical concepts are basic to the role of all Peace Corps Volunteers. While the use of visual aids can enhance the communication process, it can also be problematic and complex in cross-cultural situations. The preparation and presentation of visual aids should be appropriate to the cultural background of the audience. In this session, Trainees will discuss some of the issues relating to the effective use of visual aids in their countries of assignment and practice making visual aids. They will then evaluate the effectiveness of their visual aids as communication tools. The final portion of the session will provide time to the Trainees to prepare for their up coming "Queen Rearing" presentations.

OBJECTIVES

- To list characteristics of host-country co-workers.
- To identify criteria to be used in evaluating effective visual aids.
- To evaluate sample visual aids.
- To practice making visual aids.
- To prepare for "Queen Rearing" presentations.

RESOURCES

- Communicating With Pictures
- From the Field, pp. 85-92.
- Applied Communication in Developing Countries, Chapter 11.
- Visual Aids: A Guide for Peace Corps Volunteers, pp. 21-24.
- Handout 29A, "Selecting Communication Tools"
- Handout 29B, "Visual Aids"

MATERIALS

newsprint, markers, crayons, pens, pencils, scissors, paste, colored construction paper, sandpaper, flannel, a variety of posters, a flannel graph, a picture story, problem dramas, puppets, any other relevant aids to communication

Trainer Note

○ Prior to beginning this session, set up the room such that a wide variety of visual aids and other communication aids are on display (see Step 2). Try to select visual aids which are particularly relevant to the countries in which the Trainees will be working as Peace Corps Volunteers. Include beekeeping posters, books, honey labels, or other relevant learning or marketing aids. Also, for evaluation purposes, display some aids which have proven effective and some which have not been effective.

○ Ideally, the "Resources" for this session should be either purchased or photocopied and made available to each Trainee. If this is not possible, they should be presented to the Trainees during this session and made available throughout the program as reference books.

○ In Steps 3 and 4, Trainees will be making their own visual aids. Be sure to have on hand a generous supply of the necessary tools and materials.

PROCEDURES

Step 1: **Characteristics of Host Country Co-Workers** (20 minutes)

Review the objectives of the session and outline the procedures. Ask the Trainees to name some of the characteristics of the people with whom they expect to be working as Peace Corps Volunteers. Provide focus by suggesting such examples as: poor, rural, urban, literate, semi-literate. Write the Trainees' responses on newsprint. Stimulate discussion by asking for explanations of each of the characteristics.

Step 2: **Effective Visual Aids** (40 minutes)

Ask the Trainees to keep the list developed in Step 1 in mind as they examine a variety of visual aids. Have them move about the room examining a display of various visual aids which have been used in the countries in which they will be working. Have the Trainees evaluate several examples of different types of visual aids. Demonstrate and explain several of the visual aids.

For each example, ask:

- What message does it convey?
- In which situations might it best be used?
- How effective/appropriate is it?
- How might it be improved?

Refer back to the list of characteristics developed in Step 1. Ask the Trainees to identify and discuss important criteria which should be remembered when making a visual aid. Be sure to bring out issues related to pictorial illiteracy and the tendency for culturally biased interpretations of drawings, pictures and charts. Cite examples from the information provided in the "Resources".

Step 3: **Making Visual Aids** (1 hour, 30 minutes)

Distribute Handout 29A, "Selecting Communication Tools" and Handout 29B, "Visual Aids" and explain that they have been provided as resources for the next activities. Have the Trainees divide into groups of three to four and make a simple visual aid. Ask them to work on aids which they feel they might be able to use in their assigned countries as Peace Corps Volunteers. Stress the importance of completing the visual aid within the time allotted for this step. Remind them that, later in the session, there will be time allotted to work on preparing for their "Queen Rearing" presentations. Suggest that they use this time to work on a visual aid which will help them in their next method demonstration.

When the Trainees finish, have them reconvene. Ask a representative from each group to demonstrate and explain their visual aid. Have the Trainees critique each visual aid according to the criteria developed in the previous step. Encourage discussion and suggestions for improvement.

Step 4: **Summary/Queen Rearing Preparation**
(1 hour, 30 minutes)

Ask one of the Trainees to summarize the major conclusions developed during the session. Have the Trainees divide into their queen-rearing groups and use the remainder of the morning to work on their up coming "Queen Rearing" presentations. Encourage them to be creative in developing effective visual aids for use in the presentations and throughout the remainder of the training program.

Handout 29A

SELECTING COMMUNICATION TOOLS

Visual Aid	General Description	Recommended Audience Size	Advantages	Disadvantages
Chalkboard	Rigid surface painted green or black on which one can write or draw with chalk.	10 to 30 people. If used with more, a large board is needed and careful audience placement is necessary.	Inexpensive. Can be homemade. Easily maintained. Minimum of preparation. Used day or night. Audience participation.	Transport can be difficult in remote areas. Limited to the user's artistic ability.
Flannel Board	A piece of flannel, flannelette, terry cloth or felt cloth attached to a rigid surface on which cut-out figures will adhere if backed with sand paper or glued sand.	15 to 20 people Audience size depends on the size of the flannel board and the size of the figures that are being used.	Inexpensive. Easily made from local materials. Easily maintained and transported in remote areas. Figures can be used in different presentations. Ideal for showing "sequence of events" and reviewing lesson, as figures can be brought back on the board.	Requires considerable advance preparation Difficult to use out of doors if there is any wind. Some artistic ability is required if making homemade figures.
Posters	A message on a large sheet of paper, and with an illustration and a simple written message.	No limit, because it is not necessary for everyone to look at a poster at the same time.	Inexpensive. Easy to make. Requires a minimum amount of time to prepare and use. Easy to transport.	Deteriorates rapidly. Can confuse audience with too much or too little information. Need some artistic ability if making own posters.
Flip Charts	Illustrations on paper or cloth, usually larger than 21 cm by 27 cm; bound together with rings or string. They flip over in presentation.	15 to 30 people. Audience size depends on the size of the flip chart illustration.	Inexpensive. Can be homemade and can be easily transported. Good way to give information in sequence; because they are bound, illustrations stay in sequence.	Deteriorates with constant use. Some artistic ability required if making homemade flipcharts.

Visual Aids	General Description	Recommended Audience Size	Advantages	Disadvantages
Flash Cards	Illustrations made on heavy paper that is usually smaller than 21 cm by 27 cm. The illustrations are not bound but are arranged in sequence.	5 to 15 people. Because the illustrations are small, no more than 15 people should be in the audience.	Inexpensive. Can be homemade. Very easy to transport. Good way to give information in sequence to small groups.	Deteriorates with constant use. Some artistic ability required if making homemade flashcards. Easy to get out of sequence. Limited to small groups.
Bulletin Boards	A surface, at least 3/4m by 1m, into which stick pins can be placed. Drawings, photos and lettering can be displayed on the board.	No limit, because it is not necessary for everyone to look at the bulletin board at the same time.	Inexpensive. Can be homemade from local materials. Good way to present a "changing" message in areas where people gather.	If out of doors, weather damage can occur. Constant supply of good educational materials to put on the board is needed.
Demonstration	Using actual ingredients, tools or land, the educator shows how something is done. Either at that time, or soon afterward, each audience member displays an ability to do a new thing.	1 to 30 people. Because it is difficult for an educator to follow up on more than 30 persons, this is the recommended limit.	Excellent way to use actual materials in a real situation. Uses local materials. Easy to understand by people not used to looking at illustrations. Good way to get audience participation.	Takes a lot of planning and preparation.
Film	Color or black and white, 16mm or 8mm cinema film, with sound, projected on a screen or wall.	30 to 100 people. Groups can be larger --but it is difficult to have any discussion with larger groups.	Dramatic and gets the audience's attention. Shows motion and therefore helps explain step-by-step and time sequence very well.	Very expensive, requires expensive equipment, electricity and dark projection area. Difficult to transport and operate.

Visual Aids	General Description	Recommended Audience Size	Advantages	Disadvantages
Slides	35mm film in plastic or cardboard mounts 5cm by 5 cm. In color or black and white, they are projected on a screen or a wall.	About 30 people. Though slides can be used with more people, the educator can stimulate better discussion among a smaller group.	Dramatic, less expensive than cinema film, excellent way to bring distant things to audience and to show time sequence. Battery-operated projectors available Local photos easily made.	Easy to damage, easy to get out of sequence and project upside down or sideways. Requires projection equipment, needs electricity or batteries and darkened projection area.
Filmstrips	Strip of 35mm film, color or black and white. Photographs in sequence. Filmstrip projected on screen or wall. Uses projector with filmstrip adapter. Film-strips horizontal or vertical format.	About 30 people. Though filmstrips can be used with more people, the educator can stimulate better discussion with a group of this size.	Dramatic, less expensive than film and slides. Once inserted correctly in projector, impossible to get out of sequence. Can show photos of the real thing and shows sequence in time. Battery-operated projectors available. Relatively easy to transport.	Requires projection equipment, can be damaged, requires either mains or battery supplied electricity. (Sometimes batteries are expensive) Requires darkened projection area. Limited appropriate filmstrips available.

Adapted from WORLD NEIGHBORS IN ACTION newsletter.

Handout 29B

VISUAL AIDS*

If I Hear it I forget
If I See it I remember
If I Do it I know
(Chinese proverb)

You are undoubtedly using visual aids. How often have you drawn a map on the ground, sketched a symbol or used some gesture to describe something? The following are some ideas to encourage you to make other visual aids.

Remember that in the communication of ideas, visual aids are of the utmost importance. One cannot say that any visual aid will adequately serve as a substitute for personal contact or personal efforts of communication. One can say, however, that visual material of an appropriate nature, carefully selected and effectively used can be very important to communication.

Symbols used in visual aids must be adequately understood. A bed does not look the same the world over. Neither does a coat, nor does a well, nor does a latrine. The symbols used to depict articles must be understood in the culture for which the material is intended. This is why the visual aids you make yourself can be the most effective in building understanding.

Visual aids are used to communicate an idea or convey a need for action. Action must be possible in the culture and should be in accordance with existing ways of acting, if at all possible.

Effective visual aids can be produced only if local people assist in making them. The use of visual aids is usually best accomplished when local people make and promote the use of them. If there are drawings to be made, consider having a local artist, professional or amateur, assist you.

The problem. It is important to ascertain how the problem is seen from the point of view of the local people. For example, in working on the improvement of contaminated water, there may be no problem of contamination as far as the local people are concerned. Water which looks clear may not be considered contaminated by local people. It may be necessary to help people understand how water becomes contaminated. This may be exceedingly difficult. It is important to keep in mind that age-old customs are acceptable to local people and that there must be good logical and practical reasons to change these age-old customs.

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* Much of the context and many of the examples are taken from: Visual Aids: A Guide for Peace Corps Volunteers.

Acceptable answers or solutions. We may see the situation as a scientific one; however, it must be practical and acceptable to the people concerned. For example, boiled water in certain cultures is usually consumed only by "sick" people. The answer, therefore, may lie in removing sources of contamination from water rather than trying to get people to boil it.

Selecting material to be presented. The following questions may be of assistance to you in refining ideas about the material to be presented in visual form.

Characteristics of the audience. Who are you trying to reach? Just men? Just women? Just children? What is the occupation of the potential audience? What is the cultural background? What is the education of the audience? What is the social status?

Acceptability of solution. What does the potential audience think? What are the values and goals? Is the proposed solution acceptable? What is the present attitude of the potential audience? Is the action proposed possible to attain? Is it physically possible? Is it financially possible? Is it acceptable to the people? Is it acceptable in the culture?

Understanding material. What about language? Is it understandable? Is the material attractive? Will it capture attention? Will it be interesting? Will the audience get the point?

What about visualization? Are the drawings of pictures acceptable? Is it acceptable to depict human figures? Will they be understood? Has the material been tested? Can the audience relate to the pictures? To the names? To the terms?

Suggested Steps in Making Visual Aids:

1. Work with local people.
2. Determine the material to be covered. (Using questions similar to those above may help.)
3. Pretest a draft of the material on people from the intended audience.
4. Make appropriate revisions.
5. Retest material in final form.

Pretest all materials. How can we be sure people will understand materials prepared for them -- posters, pamphlets, stories, puppet shows, visual presentations of all kinds? We can try them out. We can test them under conditions similar to those in which they will be used. Offer the materials to a group of people from the intended audience.

What is the purpose of the material? What information is it supposed to convey? What motivation is used? Is the action which is wanted clear? Does the material make people want to act?

The answers of people for whom material is intended will give you an idea of the effectiveness of your material. Suggestions may be solicited from the people as to how to make the material more attractive and to carry more "punch".

Simplicity is an asset. Studies of the understanding of visual aids indicate that too much detail is confusing.

In short, there is no one ideal teaching aid, but there are guidelines for their use. An effective teaching aid must be:

- relevant
- attractive
- simple
- convey one idea
- promote action
- inexpensive
- durable
- understandable.

SESSION 30

EXTRACTORS AND SOLAR WAX MELTERS

Trainer Note

- ○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.
- ○ The format of this session is somewhat different from that of the other Trainee-facilitated sessions. Once the session is introduced, the Trainee-facilitator will be responsible for coordinating the activities of the construction groups. After the equipment is constructed and tested, the Trainee will facilitate the review of the design and construction process. This is distinct from the session evaluation which will be facilitated by another Trainee.

TOTAL TIME 20 hours

OVERVIEW Planning, designing and constructing equipment are important skills for beekeeping Volunteers.

An extractor is a necessary component to any "high technology" beekeeping system. It is a specialized piece of equipment. The many options available in its design permit it to be built to meet specific needs.

A solar wax melter is a useful, low-cost and effective tool appropriate for all beekeeping management systems. A wax melter allows the beekeeper to begin the process of rendering the wax, thereby facilitating wax moth control. Furthermore, the solar wax melter can economically render small quantities of wax which encourages the saving of beeswax.

The Trainees, working in groups, will discuss, plan and design an extractor and a solar wax melter. They will practice group interaction skills while considering the availability of various tools and materials as well as the appropriateness (cost vs. effectiveness) of the equipment design to their future extension work.

Finding suppliers for needed materials and equipment is often difficult for development workers. Once planned and designed, the Trainee groups will buy the materials needed to construct the extractor and solar wax melter. Interacting with local merchants while procuring the needed equipment will enable the Trainees to develop an appreciation for what, where and when materials are available.

This session will provide the Trainee both transactional, cross-cultural and technical skills. The experience acquired from planning, constructing and analyzing the final products will be useful in helping the Trainees to develop their own appreciation for "appropriate technology"; thus, aiding them to develop technologies appropriate to their future sites.

OBJECTIVES

- To discuss design criteria of extractors and solar wax melters.
- To plan the construction and the purchasing of materials.
- To consider technologies appropriate to the work situation of Peace Corps Volunteers.
- To work effectively in a group.
- To purchase materials needed to construct the extractors and solar wax melters.
- To interact with the community while purchasing materials.
- To construct extractors and solar wax melters.
- To acquire and practice construction skills.
- To test the extractors and solar wax melters plus evaluating them for modifications.
- To review the design and construction processes of the extractors and solar wax melters.

RESOURCES

- Build Your Own Honey Extractor
- Let's Build a Bee Hive, pp. 78-81, 86.
- Small Scale Beekeeping, pp. 197-200, 203.
- Beekeeping in the Midwest
- Handout 30A, "Making and Using a Solar Wax Melter"

MATERIALS paper, pencils, chalkboard, cash, materials decided upon by the Trainees

PROCEDURES

Step 1: **Planning and Designing** (2 hours)

Outline the entire session to the Trainees and list the objectives.

Ask the Trainees to describe the desired attributes of an effective extractor and solar wax melter. Have a Trainee list these attributes. Consider designs appropriate to their future work situations. Show plans, pictures or simple drawings to illustrate points. Discuss various options available.

Have the Trainees divide into groups of six for the remainder of the session and provide each group with plans, including Handout 30A, and resource materials useful for designing the equipment to be made.

Have each group design an extractor and solar wax melter and make a list of materials and tools needed.

In preparation for Step 2, have the Trainees plan for the purchasing trip by forming small buying teams and have them estimate the amount of cash needed.

Trainer Note

- ○ Plan to have the cash ready for Step 2.
- ○ A "Bee Management Techniques" session is scheduled after this step in case more time is needed.

Step 2: **Purchasing Materials** (4 hours)

Have the Trainees purchase the materials determined in Step 1. Have them use public transportation to do this and point out that this is the common method of transport for Peace Corps Volunteers. Remind the Trainees to obtain receipts for all purchases and to keep cost records on their projects. The cost information will be used in Session 45, "Cost Analysis and Project Evaluation".

Trainer Note

- ○ Translators may be needed to facilitate the purchasing of materials in some areas. However, encourage Trainees to work as independently as possible.
- ○ This step is scheduled for Friday afternoon. This will allow the Trainees to explore local cultural activities if they wish.

Step 3: **Constructing and Testing** (12 hours, 30 minutes)

Have the Trainee groups construct their extractors and solar wax melters. Encourage the Trainees to divide up the tasks to make the most efficient use of the resources available. During the building exercise, facilitate discussions concerning what happened during the buying trips.

When the extractors and solar wax melters are completed, have the Trainees test them.

Trainer Note

- ○ As the groups are working, keep in touch with how they are proceeding and provide assistance whenever it seems appropriate. Be careful not to intervene so much as to inhibit independent problem solving within the groups.
- ○ If the need for more materials arises, have one or two Trainees from each group purchase them while the other Trainees continue working.
- ○ Allow time for cleaning up the work area after construction periods.

Step 4: **Review of Design and Construction Process** (1 hour)

Facilitate a review of the design and construction process. Critique the finished equipment. Discuss the lessons learned from the exercise and elicit suggestions as to modifications regarding both the session and the equipment. Discuss how the groups worked together during the session and suggest ways of helping the groups to work more effectively.

Step 5: **Session Evaluation** (30 minutes)

Trainer Note

- ○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".
- ○ Steps 3, 4 and 5 may take more time than scheduled. Use time from "Bee Management Techniques" to complete these steps, if necessary.

Handout 30A

MAKING AND USING A SOLAR WAX MELTER

A solar wax melter is a glass-covered box that uses the heat of the sun to melt beeswax and to separate it from honey and other materials with which it is found in honey bee colonies. The melter can be used to render old combs, cappings, burr combs and other hive scrapings containing wax. It is also handy for removing beeswax from excluders. The melter produces wax of high quality and eliminates the need for the sometimes hazardous job of rendering wax in the home.

The sloping top surface of the solar wax melter provides maximum exposure to the sun and allows honey and melted wax to drain quickly into the storage pan. Before use, the entire unit, including the sheet metal pan, should be painted black for maximum heat absorption. The glass cover with two sheets of double-strength glass about 1/4 inch apart helps to retain the absorbed heat. The fiberboard insulation also serves the same purpose. Internal temperatures, well above the melting point of beeswax (about 145° F, [63° C]), are maintained on warm sunny days. Place the melter in a sunny, sheltered spot for best results.

The attached plan, is meant to provide ideas on how to build a melter. You need not copy the plan exactly. For this reason, many dimensions are not given, especially the less important ones. Modify the dimensions to fit your needs, or the materials available, but beware of making it too small. The sheet metal pan should be 4 to 6 inches deep and big enough to accept excluders (16-1/4 x 20 inches) or at least two full-depth frames (19 x 20 inches). Consider the possibility of making one or more cappings baskets of "expanded" metal that will fit into the sheet metal pan.

The pan to catch the hot honey and melted wax should be relatively large to prevent accidental overflows. A plastic dish pan works well. The wax can be easily removed because it does not adhere well to the smooth, flexible plastic. Sloping sides on the pan also make it easier to remove the cake of wax.

The wooden brace is designed to support the lid while you clean out the slumgum, or residue, that remains after combs are melted. It lies between the exterior box and the interior layer of insulation. The finger hole, or notch, is used to pull it up into place. Cut the free end at an angle so that it makes firm contact with the lid frame when the lid is a suitable height to work beneath.

The melted wax will flow more easily down the pan if the combs, excluders and cappings baskets are set on lengths of metal rods or angle iron. You should also put a coarse screen across the outlet

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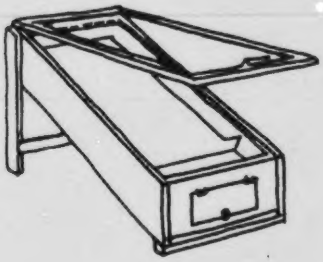
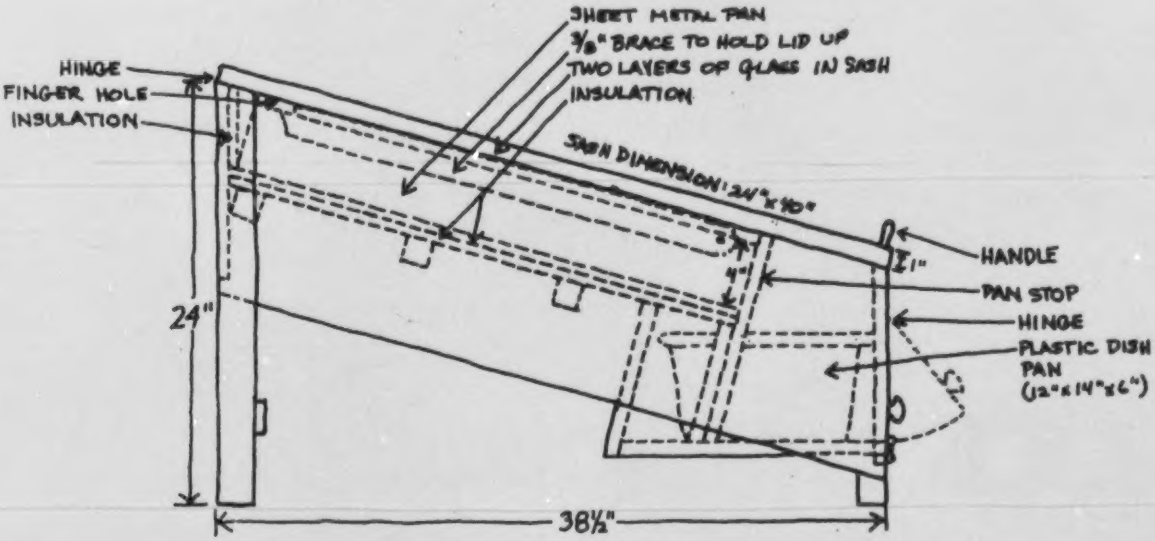
from: An extension leaflet by Elbert R. Jaycox, University of Illinois at Urbana-Champaign.

of the pan to keep unmelted pieces of comb and other debris from flowing into the pan of molten wax. Honey collects beneath the wax in the pan. It is darkened and unsuitable for human food, but can be used to feed bees in early spring (not in the fall). The slumgum remaining in the sheet metal pan contains beeswax that can be removed only by a hot water press. If you accumulate 100 pounds or more, it is worthwhile having it rendered commercially.

The melter is highly attractive to robber bees because of the odors given off by the warm honey and wax. It should be kept tightly closed except when loading it or removing the filled collecting pan.

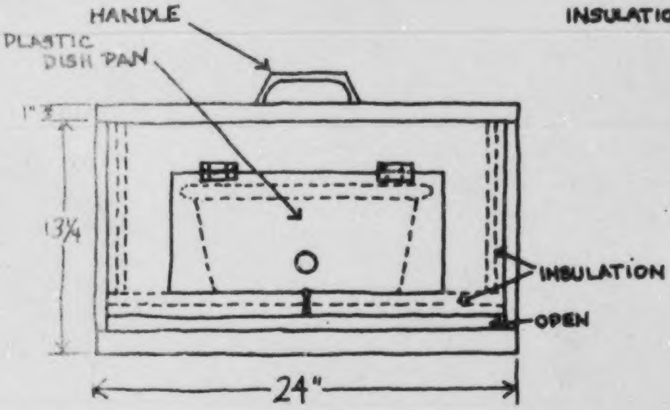


SOLAR WAX MELTER

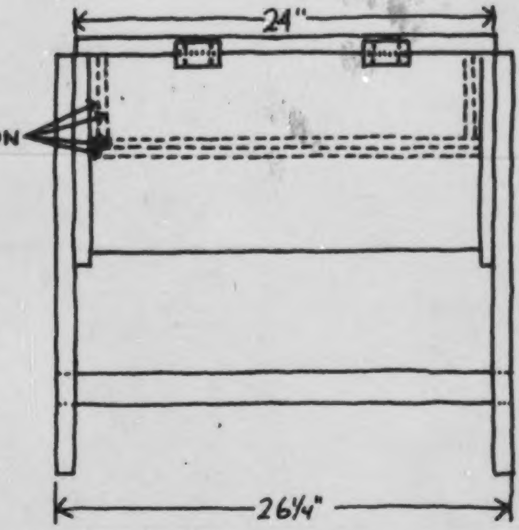

SHEET METAL PAN
3/8" BRACE TO HOLD LID UP
TWO LAYERS OF GLASS IN SASH
INSULATION
HINGE
FINGER HOLE
INSULATION
SASH DIMENSION: 24" x 40"
2"
4"
1"
HANDLE
PAN STOP
HINGE
PLASTIC DISH PAN (12" x 14" x 6")
24"
38½"

SIDE VIEW

The wax melter has a double layer of ½" Celtex, except for the top rear, which has a single layer, and the front, which has no insulation.


HANDLE
PLASTIC DISH PAN
1"
13¾
INSULATION
OPEN
24"

FRONT VIEW OF FACE


24"
INSULATION
26¼"

BACK VIEW

SESSION 31

WOMEN IN DEVELOPMENT – THE ROLE OF MEN AND WOMEN

TOTAL TIME 4 hours

OVERVIEW An understanding of the roles of men and women within a culture is an important part of the personal and professional life of a Peace Corps Volunteer. This session introduces the Trainees to the complexity of the issues regarding the concept of Women in Development. Trainees identify traditional roles of men and women while discussing their reactions to them as North Americans. They examine ways in which these roles will influence both their professional lives as Peace Corps Volunteer beekeepers and their personal lives as individuals adjusting to a new culture.

OBJECTIVES

- To define the term "Women in Development" as related to Peace Corps goals and programming.
- To identify the traditional role of women in the host country.
- To evaluate these roles in light of personal values and perspectives.
- To identify ways to recognize and deal with women in development issues in beekeeping projects.
- To examine personal needs regarding emotional and sexual relationships with others.

RESOURCES

- Third World Women:
  "Background Notes on the History and Rationale of the Term Women in Development: WID Peace Corps Policy", Module II, pp. 20-24.
  "Guideline for Country-Specific Presentation on WID", Module III, p. 12.
  "The Adverse Impact of Development on Women", Irene Tinker, Module IV, pp. 23-30.
- Women And World Development:
  "The Dilemma of Peasant Women: A View From the Yucatan", pp. 89-94.
- Handout 31A, "Strategies for Integrating Women-In-Development Projects"
- Handout 31B, "Personal Needs Booklet"

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

- ○ Depending on where the training is being held, the Trainees may need country-specific information relating to the traditional roles of men and women in order to complete Step 2. If necessary, the trainer should be prepared to provide this information in the form of a lecturette or directed readings.
- ○ Prior to beginning the session, prepare the booklets called for in Step 4. To assemble the booklets, follow the instructions provided for Handout 31B, "Personal Needs Booklet". Prepare one booklet for each small group.
- ○ For Step 4, it is important to help the Trainees relax as much as possible in order to create a climate conducive to open communication. Consider serving refreshments, scheduling the step for the evening and/or meeting in an informal, non-threatening setting.

Step 1: **Definition of Women in Development** (25 minutes)

Review the session objectives and discuss the definition of the term "Women in Development". Write down some of the definitions on newsprint. Distribute copies of "Background Notes on the History and Rationale of the Term, Women in Development" and allow time for reading. Ask the Trainees to reconsider their definitions of WID and discuss any changes they would make in light of the new information. Briefly identify reasons for treating WID issues in this beekeeping training program.

Step 2: **Traditional Roles** (45 minutes)

Have the Trainees brainstorm a list of what they feel will be the traditional roles of men and women in the countries in which they will be working as Peace Corps Volunteers. Have them reflect upon their family live-in experiences as a source of ideas. Ask the Trainees to individually look over the lists and think about which aspects of these roles they consider to be positive and which they consider to be negative.

Have them divide into small groups and discuss the following:

- Why do we perceive some of these roles as positive and others as negative?
- Which aspects of North American culture influence our reactions?
- Why do these roles exist?
- Why have they evolved as they have?

Ask each small group to be prepared to present and discuss two conclusions which come out of their discussion.

Step 3: **The Impact of Traditional Roles On Beekeeping** (50 minutes)

Reconvene the large group and conduct a round table discussion of the conclusions developed by the small groups. Ask the group to reflect upon how these roles may affect them as beekeeping Volunteers. Distribute handout 31A, "Strategies for Integrating Women-in-Development Projects" and focus a discussion on the following points:

- What more do you need to find out about sex roles in your countries of assignment?
- How can you find out more?
- What are some strategies for appropriately integrating men and women into beekeeping projects?

Summarize the major recurring themes and solicit suggestions from the group regarding how they plan to cope with sex role behaviors which they consider to be negative. Distribute copies of the articles, "The Dilemma of Peasant Women: A View from the Yucatan" and "The Adverse Impact of Development on Women". Explain that these articles provide perspectives on various issues relating to WID. Recommend that Trainees read them.

Step 4: **Personal Needs** (1 hour, 30 minutes)

Explain that another important aspect of sex roles involves the Trainees' own personal needs regarding emotional and sexual relationshps with others. Distribute the booklets provided in Handout 31B, "Personal Needs Booklet". Have the Trainees divide into small discussion groups of three or four. Go over the instructions described on page one of the booklet. Have the groups go to a comfortable location and work through the booklets. Remind them to pace themselves so that they can finish all of the questions in the time allotted.

Trainer Note

○ When the Trainees divide into groups, make sure that the number of men and women in each group is as equal as possible.

○ While the groups are working, move from group to group, clarifying and answering questions as necessary.

Step 5: **Strategies for Coping** (30 minutes)

Conclude the activity by reconvening the group and focusing a discussion around the following question from the booklet:

- As a single or married Peace Corps Volunteer, I think my most difficult personal problems will be.......

Ask the Trainees to share how they answered this in their small groups. List some of their responses on newsprint and ask them to identify ways in which they plan to cope with or resolve these problems.

Handout 31A

Strategies for Integrating Women in Development Projects

Asking, listening and observing in order to identify women's needs.

Identifying women's roles, opportunities and handicaps.

Identifying cultural, social, family and other patterns which impact on women positively and negatively.

Identifying, developing and using women leaders and supportive men.

Identifying positive and negative effects of projects on women and children.

Helping in the development and advancement of women counterparts.

Developing and implementing income-generating activities or projects for women.

Integrating women into decision-making levels of project planning, implementaton and evaluation.

Introducing and giving training for time-saving devices used for women's domestic tasks.

Providing opportunities for women to move from traditional roles or jobs to non-traditional roles or jobs.

Providing programs or activities to strengthen women's traditional roles, i.e., status, income, social rewards.

Helping government, other developers and community people look at the role of WID.

Raising productivity of tasks performed by women.

Identifying and using local organizations traditionally supportive of women.

Researching, analysing and using data about women's role and status.

Sharing information and analyzing failures and successes of projects directed to women's needs.

Helping and educating other women and men in order to increase their understanding and support of WID.

Handout 31B

Personal Needs Booklet

Note: To assemble the booklet, cut the pages into strips along the dotted lines. Staple the strips together in the order indicated by the numbers next to the open-ended statements.

. . . .

The basic purpose of the discussion you are about to have is to focus on your perceptions and feelings about personal and sexual relationships:

Please follow these guidelines:

1. The discussion consists of a series of open-ended statements. Each of you should respond to each statement before continuing on to the next one.
2. Take turns being first to complete the statements.
3. Complete the statements in the order in which they appear. Do not look ahead in the booklet or skip items.
4. All of this discussion is confidential.
5. You may stop the activity if you become uncomfortable. Talk over the source of such feelings and continue when appropriate.
6. Be willing to take risks.

When you have read this, turn the page and begin.

1. When I talk about sex or emotional needs, I feel..........

. . . .

2. If I were really open and honest right now, I would say........

3. To me, a meaningful relationship consists of ....

. . . .

4. Emotional and intellectual involvement in a relationship consists of ....

5. For me, a meaningful relationship with a host country national would be ......

. . . .

6. For me, sex in a relationship is ....

7. Something I want from a relationship that I find lacking now is ......

. . . .

8. As a Trainee, my social and sexual life have been ....

9. I think my nights in my site will be ....

. . . .

10. Since being here my perception of social life has changed in that ......

11. Regarding the way men and women here interact socially, I have trouble with .....

. . . .

12. I think I'll meet my personal needs in-country by .....

13. Some of the consequences of the ways I choose to meet my needs might be ......

. . . .

14. As a single/married Peace Corps Volunteer, I think my most difficult problems will be ......

15. What I have learned most about myself from this exercise is......

. . . .

SESSION 32

MID-PROGRAM EVALUATION

TOTAL TIME 4 hours

OVERVIEW

Constant evaluation is necessary during the program in order to help adjust what "is" to more clearly reflect what "ought to be". This often involves modifying the behavior of Trainees or trainers, the resources being applied, or the methods and approaches being used. Sometimes personal expectations need to be adjusted. The "Mid-Program Evaluation" allows Trainees and staff to determine if the program is moving in the right direction at the proper pace. Trainees and trainers first evaluate their working dynamics as a group. The Trainees then complete a detailed written evaluation of various aspects of the program. The final activity involves working in small groups followed by dialogue among all participants regarding the extent to which original expectations have been met.

OBJECTIVES

- To assess the working dynamics of the group within the context of the training program.
- To complete a written evaluation of the overall effectiveness of the program and of the trainers.
- To evaluate the extent to which original expectations have or have not been met.

RESOURCES – Handout 32A, "Evaluation Questionnaire"

MATERIALS newsprint, markers, blank paper, pens and pencils

PROCEDURES

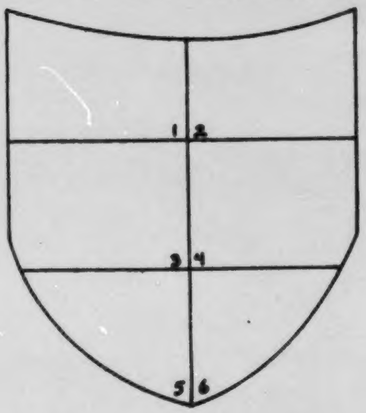
Trainer Note

○ It is important that the entire training staff participates in Steps 1 and 3 of this session.

○ Prior to beginning this session, prepare on newsprint:

- the list of questions for the "Coat of Arms" activity (see Step 1),
- a chronological list of all sessions which have occurred to date (see Step 2) and
- a list of the names of all trainers who have participated to date (see Step 2).

• • •



○ The design of the blank "Coat of Arms", described in Step 1, may vary according to individual taste. This design is provided as an example.

Step 1: **Group Dynamics** (1 hour, 30 minutes)

Briefly present an overview of the entire session and explain how the evaluation results will be used. Begin by explaining that the object of this first activity is to evaluate the dynamics of the group. Each person will draw a symbolic "Coat of Arms" which represents their perception of how effectively the group is working. On a blank sheet of paper, have the participants sketch a "Coat of Arms" and divide it into six blank spaces. Post and explain the following questions:

- What has been our major failure as a group?
- What has been our major accomplishment as a group?
- To what extent do our interactions here in training reflect the kinds of interactions we will encounter as Peace Corps Volunteers?
- What is our major unresolved conflict or problem as a group?
- What can we do to resolve this conflict or problem?
- What can we do to improve our interaction skills in general?

Refer to the posted list. Read each question in order. Have each participant draw a symbol that answers each question in the corresponding space on their "Coat of Arms". Draw your own "Coat of Arms", as the group does theirs.

After everyone has finished drawing their "Coat of Arms", share yours by explaining the meaning of each of your six drawings. Have each participant explain the meaning of their "Coat of Arms". Conclude by asking one of the participants to summarize the results of the activity, highlighting any recurring themes.

Trainer Note

- As they describe their "Coat of Arms", Trainees may tend to discuss the design and content of the program. At this point keep them focused on their interactions as a group.

Step 2: **Written Program Evaluation** (1 hour)

Distribute Handout 32A, "Evaluation Questionnaire", and have the Trainees complete it. Explain that the questionnaire provides an opportunity to communicate, in writing, thoughts about the effectiveness of sessions and of the training staff. As an aid in completing Parts II and III of the questionnaire, post a chronological list of all sessions presented to date and a list of all trainers who have participated to date. Point out that Trainees need not put their names on the questionnaires. Encourage open and thoughtful responses. Let the Trainees know that the information provided on the questionnaires will be used by the staff to improve the training program.

When the Trainees have finished, collect the completed questionnaires.

Trainer Note

- If some Trainees do not finish the questionnaires in the time allotted, they may turn them in later.
- Later, the entire staff should review the questionnaires and discuss those aspects of the program and/or their training styles which seemed particularly effective and/or ineffective.

Step 3: **Analysis of Expectations** (1 hour, 30 minutes)

Explain that the Trainees will now have the opportunity to verbally evaluate the program and to provide direct feedback to themselves and the training staff. Have them divide into groups of three to five. Have each group list, on newsprint, four ways in which their expectations have been met and four ways in which their expectations have not been met.

When the groups have finished, ask them to post their lists at the front of the room. Briefly review the lists, pointing out any common themes or recurring ideas. Have the Trainees select and carry out one of the following:

- Option A: Have a representative from each group explain and discuss their list.
- Option B: Use the lists as a basis for moving into the "Fishbowl" activity described in Session 13, "Introduction to Program Evaluation".

HANDOUT 32A

EVALUATION QUESTIONNAIRE

This questionnaire provides us with information we can use to increase the effectiveness of the training. We would appreciate your thoughtful consideration in making specific comments to tell us why an activity was useful or why it was not as useful as it might have been.

Part I: Over-all Evaluation:

Provide an over-all rating of the program to date by circling a number on the scale.

1. Development of Technical Competence:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

2. Development of Cross-Cultural Awareness and Sensitivity:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

3. Development of Extension and Technology Transfer Skills:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

____

____

____

4. Use of Varied Learning Techniques:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

____

____

____

5. Emphasis on Practical Experience:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

____

____

____

6. Focus on Future Role as a Peace Corps Volunteer:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

____

____

____

Part II: Sessions

From the list provided, identify and rate the usefulness of any specific sessions which you feel strongly about.

Session Title 1. ____________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Session Title 2. ____________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Session Title 3. ____________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Session Title 4. ____________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Session Title 5. ____________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Session Title 6. ____________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Session Title 7. ______________________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Session Title 8. ______________________________

Not Useful		Moderately Useful		Very Useful
1	2	3	4	5

Comments:

____

Part III: Trainers

List the name(s) of your major trainer(s) in the blanks provided and comment on their overall effectiveness. Use the following points for consideration:

- ability to effectively communicate information.
- apparent knowledge of subject matter.
- ability to integrate the major components of training, e.g., technical, health and nutrition, women in development, extension, cross-cultural and role of the volunteer in development.
- methodology (flexibility, adult learning principles, etc.)

Name: ______________________ Comments: ____________________

____

____

Name: ______________________ Comments: ____________________

____

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Name: ______________________ Comments: ____________________

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____

Name: ______________________ Comments: ____________________

____

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Name: ______________________ Comments: ____________________

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Name: ______________________ Comments: ____________________

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____

Name: ______________________ Comments: ____________________

____

____

Part IV: Participation

Do you feel that you have participated in the discussions to the extent that you wanted? ( )Yes ( )No

Do you feel that other participants have had an equal opportunity to contribute to the discussions? ( )Yes ( )No

Comments: ______________________________

____

____

Reflect on and pick out the three most important things you have learned (such as a particular content, an insight, an interaction, a process, something shared, etc.) and write them in the blanks provided.

1. ______________________________

____

2. ______________________________

____

3. ______________________________

____

List any difficulties or problems with the training to date and suggest how they might be corrected.

____

____

____

____

____

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SESSION 33

MELLIFEROUS PLANTS

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW Melliferous plants and bees are the key components of any beekeeping venture. It is important to understand the plant-bee interaction, as well as the basic biology of the plant. The effects of this relationship on the plant and the bee are examined and reviewed. This session provides the Trainees with the background to explore the beekeeping potential of an area, to recognize major bee-plant groups and determine the various major plant sources of honey.

OBJECTIVES

- To examine basic floral anatomy.
- To discuss pollination and cross-pollination.
- To examine the role of the bee in plant pollination.
- To examine the characteristics of a "good" honey plant.

RESOURCES

- Insect Pollination of Cultivated Crop Plants, pp. 1-18, 23-45.
- Source Materials for Apiculture, #3.
- A Book of Honey, pp. 7-38.
- Tropical Legumes: Resources for the Future
- Beekeeping in the United States, pp. 73-77, 107-118.
- Firewood Crops: Shrubs and Tree Species for Energy Production
- The Hive and the Honey Bee, Chapters 8, 9 and 20.
- Forestry Training Manual, Session 32.
- Exotic Plants for House and Garden
- The Dancing Bees, Chapters 3, 8 and 9.

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MATERIALS hand lens, unlabeled schematic drawing of a flower, different examples of "bee attractive" plants (or pictures or slides), unlabeled schematic drawing

PROCEDURES

Step 1: **Floral Anatomy** (30 minutes)

Pass out a flower to each Trainee. Have each Trainee examine their flower and identify the various anatomical structures. Explain and discuss the structures. Post the schematic drawing and have the group label the various floral structures.

Touch on the fact that the Leguminosae and Compositae plant families contain major bee-plants in most parts of the world. Discuss, through the use of examples or pictures, the important characteristics which distinguish these families.

Trainer Note

- ○ Resources for the schematic drawing are The Hive and the Honey Bee, p. 585; A Book of Honey, p. 20; Insect Pollination of Cultivated Crop Plants, p. 9; Beekeeping in the United States, p. 108-114.
- ○ Do not allow this step to become too academic. Allow the interests and needs of the group to determine the amount of detail necessary.

Step 2: **Field Excursion** (1 hour, 15 minutes)

Direct a "nature walk". Encourage the Trainees to observe, examine and share their questions and observations with the group. While on the walk have the Trainees:

- collect, dissect and identify floral structures, using a hand lens
- define plant pollination and cross-pollination
- examine the role of the bee in the pollinating process
- identify bees collecting nectar and pollen
- discuss factors which make flowers attractive to bees
- outline the multi-purpose use of plants and
- find and identify Composites and Legumes.

Encourage interested Trainees to collect, examine and identify plants used by bees throughout the training program and to share their observations with the group.

Step 3: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

SESSION 34

PREPARATION FOR SITE VISIT – INFORMATION GATHERING

TOTAL TIME 4 hours

OVERVIEW

All Peace Corps Volunteers are assigned sites. All of them must enter that site and, through careful on going investigation, gather the information necessary to adapt. The site visits provide Trainees with the opportunity to experience this process of entering and investigating a community. One of the important features of the site visit is that it enables each Trainee to experience another culture and enter a community completely on their own, without the immediate support of the training staff.

This session sets the stage for the site visits. Trainees work together to define the concept of "community" and to determine what kinds of information they will need to obtain in order to adapt socially, physically and professionally to a new environment. In this session, Trainees will develop personalized strategies for gathering this information. The session ends with the trainer assigning sites and finalizing all necessary logistics and preparatory details.

OBJECTIVES

- To develop a working definition of the concept of "community".
- To identify information to be gathered through community analysis.
- To discuss information gathering techniques.
- To develop personal strategies for gathering information during the site visits.
- To finalize preparation for the site visits.

RESOURCES – Community, Culture and Care, pp. 1-41.

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

- ○ This session will require considerable preparation. Arrangements need to be made for the Trainees to conduct a three-day visit to a community similar to one in which they will be working as Peace Corps Volunteers. Each site should be two to six hours away from the training facility by public transportation. A member of the training staff should visit each of the sites in advance to obtain such information as: availability of public transportation, restaurants and lodging facilities. Identify one site for each Trainee.
- ○ Also, write on newsprint the "information-gathering phases" and the "guidelines for entering a community" described in Step 3. Having these ready to be posted will help make the activity flow more smoothly within the time frame indicated.

Step 1: **Definition of Community** (40 minutes)

Begin by reviewing the objectives and procedures of the session. Explain that the community analysis strategy which Trainees develop in this session can serve as a model for approaching their communities as Peace Corps Volunteers.

Point out that in order to analyze a community effectively, it is necessary to first have a working definition of what is meant by the word "community". Have the Trainees divide into two large groups and develop, on newsprint, their own definitions of "community".

Have each group report back and present its definition to the other group. Encourage discussion of the definitions. Look for common characteristics in the two definitions and arrive at a working definition which is acceptable to everyone.

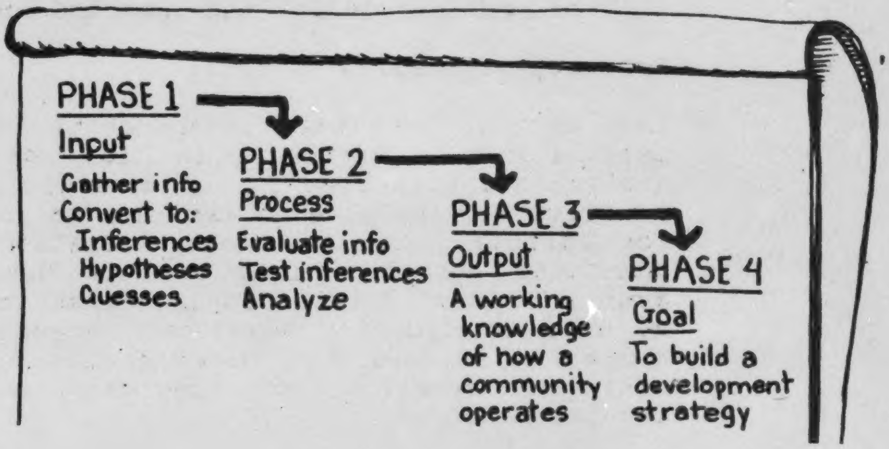
Step 2: **Components of a Community** (30 minutes)

Using their working definition as a reference, ask the Trainees to brainstorm a list of "component parts" or "sub-sections" of a community. Have one of the Trainees write the responses on newsprint. Stimulate the list and provide focus by suggesting such components as: families, the education system, religion, geography, the economy and health systems.

When the list is completed, help the Trainees to pare it down to what they consider to be the four most relevant components to their interests as Peace Corps Volunteers.

Step 3: **Information Gathering** (1 hour)

Explain that individuals are constantly gathering information which they filter, validate and analyze to create a framework for understanding and decision-making. Describe the information gathering process as a series of phases. Post the following and explain these phases:


PHASE 1
Input
Gather info
Convert to:
Inferences
Hypotheses
Guesses
PHASE 2
Process
Evaluate info
Test inferences
Analyze
PHASE 3
Output
A working knowledge of how a community operates
PHASE 4
Goal
To build a development strategy

Point out that in this session and during the site visits Trainees will be focusing primarily on Phases 1 and 2. Phases 3 and 4 will be discussed in more detail following the site visits.

Divide the Trainees into four groups. Assign each group one of the four components identified in the previous Step 2. Have each group:

- decide what information they would want to gather as related to their component,
- identify how they will go about acquiring the information and
- prepare to report the results of their work to the rest of the group.

Have each group report back and present its strategy for gathering information. Encourage discussion and questions among the Trainees. Be sure to focus on identifying interrelations among the components, techniques for validating information and examples of "open", "closed" and "leading" questions.

Ask the Trainees to summarize conclusions based upon their presentations. Post and briefly explain the following list of guidelines for entering a community:

- Look and listen.
- Remember, you are a guest.
- Allow time to sensitize to local ways and local ecology.
- Examine support systems: customs, services, technologies.
- Recognize your own biases as filters through which you see.
- Verify information through the process of triangulation (checking information by asking several people for the same information).

Step 4: **Personal Strategies** (1 hour)

Have each Trainee work independently to prepare a personalized, written plan for gathering and analyzing information in the communities they will be visiting. Be sure to ask them to include a plan for assessing the bee-human relationship in the community and for bringing back samples of any available local honey. Explain that the honey will be used in upcoming sessions. Suggest that they share their plans with someone else in the group, soliciting feedback and making changes based on the new perspectives.

Step 5: **Site Assignments** (50 minutes)

Assign each Trainee the site which they will visit in the coming three days. Have them individually jot down a list of information about their sites which they feel they can obtain in and around the training center. Suggest such logistical details as: maps, bus schedules, available hotels and restaurants. Allow the Trainees a few minutes to see how much of the information they can acquire by asking individuals in the area. Point out that this brief exercise can provide them with an idea of what it will be like trying to gather information during the site visit.

Reconvene as a group and briefly discuss the information gathering experience. Clear up any questions or doubts which may still exist. Be sure that each Trainee has a clear idea of how to get to and from their site and of what to do in the event of an emergency.

SESSION 35

SITE VISIT – FOLLOW-UP AND CONCLUSIONS

TOTAL TIME 4 hours

OVERVIEW During the site visits, the Trainees will have many unique and varied learning experiences. It is important to enable the Trainees to share these experiences and to draw conclusions from them. In this session, Trainees share experiences, review their accomplishments and draw conclusions regarding the nature of the communities visited. They are introduced to a format for working effectively in groups and for conducting effective meetings. Trainees apply what they have learned during the site visits by modifying the information gathering strategies which they developed prior to the site visit.

OBJECTIVES

- To share personal experiences during the site visits.
- To review accomplishments and assess approaches to community analysis.
- To practice using structured meeting roles.
- To modify and improve personal strategies for gathering information.

RESOURCES

– Community, Culture and Care, pp. 1-41.
– Handout 35A, "Four Roles for Structured Meetings"

MATERIALS newsprint and markers

PROCEDURES

Step 1: **Sharing Experiences** (40 minutes)

Explain that this session will provide Trainees with an opportunity to share their experiences during the site visits and to learn from one another. Ask each Trainee to write a phrase or short sentence which describes something humorous that happened to them during the site visit. Collect their responses and quickly copy them onto a large piece of newsprint. Post the newsprint and stimulate sharing by asking the Trainees to try to guess which experience belongs to which Trainee.

Trainer Note

○ The goal of this activity is to create a medium through which the Trainees can share anecdotes and release emotional reactions. Maintain a relaxed and free-flowing climate during the activity.

Step 2: **Reviewing Accomplishments** (50 minutes)

Ask the Trainees to individually write down three aspects of their information gathering plan -- only one of which should be related to beekeeping -- which they feel they succeeded in carrying out and two aspects of their plan which they did not carry out. Go around the room and have each Trainee explain what they have written. Have them describe why they feel they accomplished certain aspects of their plans and not others. Encourage discussion and the sharing of ideas by asking such questions as:

- What methods of information gathering did you use?
- How did the interviewing go? Did you work in groups or individually?
- Did you use the process of triangulation to verify the information?
- Did you have to revise your strategies?
- What was the most difficult aspect of this experience?
- What improvements or differences could be made in information gathering methodology?

Trainer Note

○ If the group is large, divide the Trainees into two or three small groups so as to keep within the specified time. Assume that each Trainee will need approximately five minutes to describe and discuss their accomplishments.

Step 3: **Structured Meeting Roles** (15 minutes)

Explain that in the remainder of the session Trainees will practice working effectively in groups while simultaneously examining the results of their site visits. Distribute Handout 35A, "Four Roles for Structured Meetings". Ask the Trainees to look it over and answer any questions they may have.

Step 4: **Community Analysis** (1 hour, 30 minutes)

Have the Trainees divide into three or four small groups with each group identifying a discussion guide, timekeeper, recorder and observer as described in the handout. Have each small group work together for approximately 30 minutes to:

- reflect upon their site visits and discuss any general conclusions which can be drawn about the communities they visited,
- identify the perceived "strengths", "signs of stagnation or decay" and "areas of most potential" of the communities and
- design a creative and effective way to present this information to the rest of the group.

When the Trainees reconvene have each group give its presentation. Allow time at the end of each presentation for comments, questions, and/or feedback regarding the content and the effectiveness of the presentations. Also, briefly discuss how successfully each group used the structured roles to help meet its goals. The following questions will help focus this discussion:

- Was there participation by all group members?
- How were decisions made?
- How were tasks accomplished?
- How might your group have worked together more effectively?

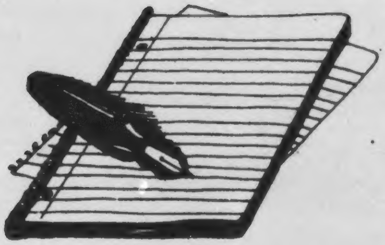
Trainer Note

○ If the program includes Trainees who will be working in different countries, have them divide into country-specific groups for these activities.

Step 5: **Personal Strategies (45 minutes)**

Review the objectives and solicit feedback regarding how well they were met. Ask the Trainees to work individually on modifying their personal information gathering strategies which they developed prior to the site visit. Recommend that they keep these for future reference when they are entering their assigned communities as Peace Corps Volunteers.

Point out that the information which they gathered on the bee-human relationship will be useful in planning a feasibility study for beekeeping development in Session 42, "Project Planning".



Handout 35A

Four Roles For Structured Meetings

1. Discussion Guide: Guides the members through the meeting.
2. Timekeeper: Keeps track of the time.
3. Recorder: Records information for use during the meeting.
4. Process Observer: Watches and reports how members are working together as well as what they are accomplishing.

NOTE: Group members become stronger as they practice each role. So, rotate all four roles. Stronger members mean more group energy!

Discussion Guide:

- Start the meeting at the scheduled time.
- Conduct attunement and "be here now" activities.
- Go around the group to see if everyone is ready to begin the meeting. Take care of individual needs before starting business.
- Be sure the group has a timekeeper, a recorder and a process observer.
- State the purpose of the meeting as you see it. Get an agreement. (If this means changing the purpose, that's all right. Consensus of members about the meeting's purpose or goal has to be reached before proceeding.)
- Reach an agreement on the closing time. Ask the timekeeper to give the group a 10-minutes signal before closing time (or whatever warning they want).
- Ask the group to call out tasks to be accomplished in order to reach the goal. Ask the recorder to write them on the chalkboard.
- Assist the members in selecting the order of importance and the time allotted for each task.
- Guide the members in working through the agenda items.
- Ask for the process observer's report.
- End the meeting with attunement or other form of closure.

Timekeeper:

- Act as an alarm clock, not a judge. (That is, alert the others at the times they ask. If members agree on a time extension, be ready to respond to the "resetting". It's all right if tasks are not completed according to plan!)

- If no one else does it, be sure to get the time allotted for each task. (You don't have to do all of the work on time needs if others are willing to share this.)
- Remind the group members near the end of the meeting to save time for the process observer's report.
- Remind; don't reform. Be gentle.

Recorder:

- See that a wall chart (or chalkboard) is in everyone's full view. Have marking pens or chalk and eraser ready for use.
- Write agenda items and their priority (order of importance) and the time allotted for each (if the group wants this kind of assistance).
- Keep whatever kind of record the members ask.
- Record the proposals and read them to the group at the end of the meeting.

Process Observer:

Watch (like a camera, without judgment, if possible) how the members work together. Ask for time at the end of the meeting to give your answers to the following questions:

- Did the members all agree on the meeting's goal?
- Was the style of leadership appropriate for the task?
- Was the timekeeping effectively carried out?
- Was recording, as needed, effectively carried out?
- Did members show feelings of friendliness and trust?
- Did everyone participate in some way?
- Did members reach their goal, or, if not, did they understand why not?

On a scale of 1 to 10, rate the success of the group life (apart from the group task):

1 2 3 4 5 6 7 8 9 10

Remember that you can take part in the meeting as well as observe it!

Adapted from *Psycho-Cybernetics*, Maxwell Maltz, Englewood Cliffs, Prentice Hall, 1960.

SESSION 36

HONEY

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW Honey is the primary product of the hive and the product with which consumers are most familiar. Quality, which is largely dependent on proper processing and careful marketing, is the main standard used by consumers to judge honey. In this session, Trainees will discuss uses, quality, storage and marketing of honey. Furthermore, they will examine methods appropriate to small-scale beekeepers for handling honey in order to maintain high quality. This information will equip the Trainees to better understand both the nature and the marketing of this product.

OBJECTIVES

- To explore various uses of honey.
- To discuss quality standards in honey.
- To discuss the physical and chemical properties of honey.
- To examine methods of marketing honey.
- To discuss problems in storing honey.
- To consider the ethics of carrying out beekeeping development programs in areas where honey is traditionally used solely for making alcoholic beverages.

RESOURCES

- The Hive and the Honey Bee, Chapters 13, 14, 15 and 17.
- A Book of Honey
- Beekeeping in the United States, pp. 82-106.
- Small Scale Beekeeping, Chapter 8.
- Preparation of Honey for Market
- Apiculture in Tropical Climates, pp. 81-107.
- Beekeeping in Rural Development, pp. 79-84, 115-126.
- Beekeeping in Zambia, pp. 43-48.

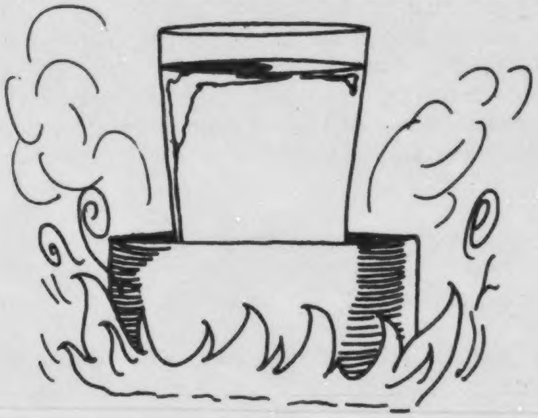
MATERIALS honey samples purchased by the Trainees on their site visits, heat source, a large pot, water, bread or crackers

PROCEDURES

Step 1: **Heating Honey** (5 minutes)

At the start of the session, begin heating a sample of honey in a double boiler. Have a Trainee watch the sample. When the honey sample is close to boiling, have the Trainee take it off the heat so that it may cool.

Retain an unheated portion of the sample. Tell the Trainees that they will be comparing the taste of heated and unheated honey at the end of the session.



Step 2: **Historical and Traditional Uses of Honey** (20 minutes)

Ask the Trainees to recount any local uses of honey that they have seen or heard about. Discuss the traditional uses of honey and relate these to local marketing possibilities. For Trainees who will be working in areas where honey is traditionally used to produce alcoholic beverages, address the ethical questions of stimulating increased honey production for this purpose.

Step 3: **Marketing Honey** (25 minutes)

Show samples of various ways to market honey. Discuss the advantages and disadvantages of each. Emphasize methods for local marketing for small-scale beekeepers. Point out that marketing is as important as producing in a beekeeping projeect.

Step 4: **Physical and Chemical Properties of Honey** (20 minutes)

Briefly discuss the conversion of nectar into honey. Discuss those physical and chemical properties of honey that affect its quality. Emphasize water content and explain that the only practical time to remove moisture from honey is before it is extracted.

Step 5: **Quality in Honey** (25 minutes)

Discuss quality standards as they relate to processing, storing, marketing and using honey. Show honey samples; point out different quality honeys and relate the quality to floral sources and processing method. Ask the Trainees what factors they consider important in honey quality. During the discussion, address the following topics in relation to quality and marketing:

- color
- fermentation
- crystallization
- contamination by antibiotics
- contamination by poisonous nectars
- contamination by heat (HMF content)

Step 6: **Tasting Honey** (10 minutes)

Have the Trainees taste honey from various sources and compare the quality. Also have them compare the taste of the heated and unheated honey.

Step 7: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

SESSION 37

OTHER HIVE PRODUCTS

Trainer Note

- This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME	2 hours
OVERVIEW	Pollen, royal jelly, venom, propolis and package bees are hive products. Their production requires intensive management techniques and their marketing is highly specialized. This session discusses the problems encountered by small-scale beekeepers in producing and marketing these products. It provides the Trainees with an understanding of both the possibilities and the difficulties associated with producing these hive products.

OBJECTIVES

- To identify techniques and methods associated with the production, use and marketing of hive products.
- To discuss the problems of small-scale farmers in producing and marketing certain hive products.
- To assess the relative cost of producing various hive products.

RESOURCES

- Small Scale Beekeeping, Chapter 8.
- The Hive and the Honey Bee, Chapter 18 and 19.
- ABC and XYZ of Bee Culture
- Contemporary Queen Rearing
- Beekeeping in the United States, pp. 58-63.
- Trapping Pollen from Honey Bee Colonies
- "Pollen and Its Harvesting"

MATERIALS newsprint, markers, nucs, pollen trap (or photos of pollen traps), samples of hive products

PROCEDURES

Trainer Note

○ Prior to starting the session, prepare, on newsprint, the chart described in Step 2.

Step 1: **Potential Products of a Bee Colony** (1 hour)

Ask the Trainees to describe what they know or have heard about the methods used in producing royal jelly, venom, pollen, nucs, package bees and propolis. Discuss these procedures and methods and point out the uses, potential value and marketing techniques associated with these products. Focus the discussion on the problems involved in producing and marketing hive products for a small-scale beekeeper. Point out, that for the small-scale beekeeper, propolis is easy to produce but marketing opportunities are limited. Demonstrate and pass around a pollen trap and other hive products.

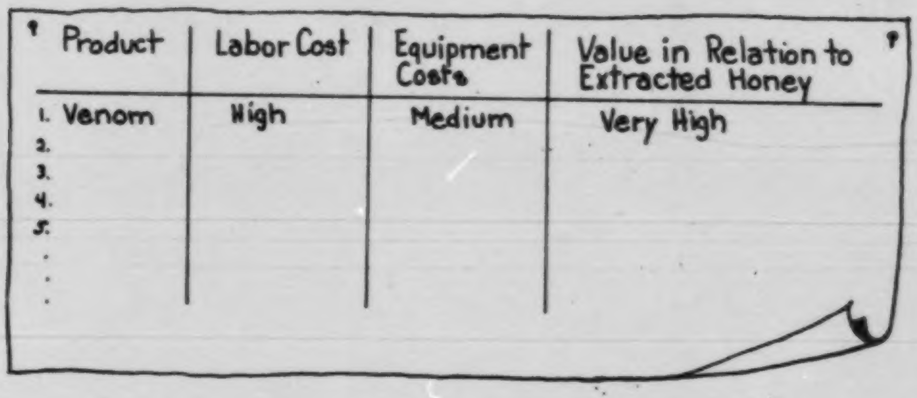
Trainer Note

○ While bee brood is a hive product, its use is very restricted. Sampling of this product will take place during Session 48, "Cooking with Honey".

○ In some training situations it may be worthwhile to make up a package of bees. If so, this can be incorporated into a "Bee Management Techniques" session.

Step 2: **Relative Costs of Production** (45 minutes)

Post the following chart with just the column titles:



Product	Labor Cost	Equipment Costs	Value in Relation to Extracted Honey
1. Venom	High	Medium	Very High
2.			
3.			
4.			
5.			
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Following the example, list other hive products and develop the chart with the Trainees. Encourage questions, analysis and comments during this procedure. Emphasize that the chart is based on the value of other hive products in relation to extracted honey, which is the most common hive product.

Have two Trainees volunteer to faciliate Session 45, "Creamed Honey and Beeswax Products".

Step 3: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle.

SESSION 38

ANAPHYLACTIC SHOCK

TOTAL TIME 2 hours

OVERVIEW People react in different ways to insect stings. It is important that the beekeeper know about the variety of possible reactions, as well as what to do in the more extreme cases. This session gives the Trainee background information on the body responses which cause anaphylactic shock and other, less severe reactions. Trainees discuss the symptoms of anaphylactic shock and the appropriate treatments. Also, Trainees are made aware of the different emergency medical treatments which are likely to be available in the future work situations.

OBJECTIVES

- To describe the different levels of human body responses to bee stings.
- To identify the causes of anaphylactic shock.
- To practice treatment of anaphylactic shock victims.
- To discuss where the necessary materials for treatment are available in small communities.
- To discuss the ethics and legal implications of treating severe reactions to bee stings.

RESOURCES

- The Beekeeper's Handbook, pp. 112-113.
- "Bee Sting Allergy"
- "Hypersensitivity to Bee Venom"

MATERIALS newsprint, markers, sting kit or treatment medicines, syringes, oranges

PROCEDURES

Trainer Note

○ Treatment in severe reaction cases is best left to professionals. This session is best facilitated by a nurse or someone with experience treating anaphylactic shock.

Step 1: **Reactions to Stings** (25 minutes)

Describe the variety of body responses to bee stings. Determine whether examples of the various reactions exist within the training group. Define anaphylactic shock.

Step 2: **The Immune System** (30 minutes)

Describe the human immune system and which reactions by the immune system produce the different responses to bee stings. Encourage questions and clarify doubts which may exist among the Trainees.

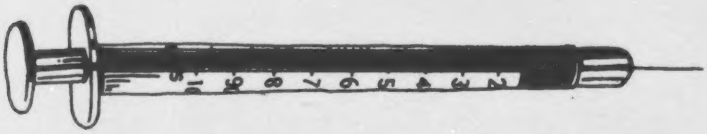
Step 3: **Treatment for Bee Stings** (20 minutes)

Discuss various treatments, including folk treatments, for the different reactions to bee stings. Question the Trainees concerning what they have been told about this and how well treatments have worked with them.

Pass around different samples of sting kits and/or syringes and adrenalin for the Trainees to examine.

Step 4: **Using a Syringe** (20 minutes)

Simulate the proper way to give injections for anaphylactic shock by injecting an orange with water.



Trainer Note

○ Under the guidance of a professional, this step can provide the Trainees with experience using a syringe and applying an injection.

Step 5: **Available Resources** (15 minutes)

Determine where sting kits or their components will be available in small communities or typical Peace Corps sites. Identify the personnel within a small community who would be adequately trained to recognize and treat bee sting victims.

Step 6: **Ethical/Legal Implications** (10 minutes)

Discuss the potential risks and ethics of treating an anaphylactic shock case from the viewpoint of a Peace Corps Volunteer in the absence of professional aid. Stimulate discussion by considering such points as:

- the beekeeper from America with the magic cures in a life-threatening situation
- what might happen if treatment does not work
- who was responsible for the victim's sting in the first place.

SESSION 39

INTRODUCTION TO THE BEE FAIR

TOTAL TIME

2 hours

OVERVIEW

This session provides Trainees with the information they will need to design and conduct a community-based Bee Fair. The Bee Fair enables them to apply their knowledge, attitudes and skills in a manner that demonstrates a grasp of the philosophy and goals of the training program. It serves as an opportunity for the Trainees to draw together the major themes of the program and to integrate the varied learning experiences which have occurred in the past weeks. Trainees are encouraged to work independently, in small groups, and with individuals from the local community. The Trainees take full responsibility for all aspects of planning, promoting, implementing and evaluating the Bee Fair.

This final emphasis on the cumulative application of skills acquired during the program is designed to assist the Trainees in making the transition from the training environment to Peace Corps service. It also serves to test Trainees' skill levels and to alert both them and the training staff to areas where more improvement is needed.

OBJECTIVES

- To review and clarify the schedule and goals of the Bee Fair.
- To review the guidelines for the Bee Fair.
- To begin to prepare for the Bee Fair.

RESOURCES

– Handout 39A, "Guidelines for Preparing for the Bee Fair"

MATERIALS

newsprint and markers

PROCEDURES

Trainer Note

○ Prior to beginning this session prepare, on newsprint, a large copy of the schedule for the remainder of the program (see Step 1).

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○ Note that this session is designed to provide the information and procedures necessary to implement all aspects of the Bee Fair. This includes the introduction, the preparation time, the Fair itself and the Bee Fair evaluation. All of these activities combined represent a total of 18 hours of scheduled training time as indicated on the six-week schedule.

Step 1: **Goals and Schedule of Bee Fair** (15 minutes)

Present a brief introduction to the purpose and general objectives of the Bee Fair. Explain that fairs are often important aspects of community life in developing countries. They provide an opportunity for people to gather, talk and learn about new happenings or innovations. Point out that the basic purpose of the Bee Fair is to provide Trainees with the opportunity to creatively demonstrate beekeeping skills as well as facilitation, communication and extension skills acquired during the training program.

Post, on newsprint, a large copy of the schedule for the remainder of the program. Highlight and explain those activities related to the Bee Fair. Be sure to include preparation time, the day of the Fair and the Bee Fair evaluation. Explain that Trainees will be expected to plan, promote, prepare, present and evaluate all aspects of the Bee Fair.

Step 2: **Guidelines** (15 minutes)

Distribute Handout 39A, "Guidelines for Preparing for the Bee Fair". Review and carefully explain each of the guidelines. Answer any questions and clear up any confusion the Trainees may have. Emphasize that, from this point on, the role of the staff will be to provide advice and guidance. The Trainees will be expected to take full ownership and responsibility for the Fair.

Step 3: **Preparation for Bee Fair** (1 hour, 30 minutes)

Allow the Trainees to use the time remaining in this session to begin their preparation for the Bee Fair. Suggest that they appoint a facilitation and begin by brainstorming a list of the major task areas associated with the Fair. Mention such areas as: promotion, budget control, scheduling, setting up, music, games and demonstration topics.

Trainer Note

○ Allow the Trainees considerable freedom and flexibility in their use of the Bee Fair preparation time. Provide support where it is necessary. Monitor their efforts and help to keep them working within the guidelines outlined in Handout 39A.

○ Events and demonstration topics which can be used successfully in programs include:

- honey tasting
- bee beards
- observation hive
- honey extraction
- KTBH
- Langstroth equipment
- beeswax products
- creamed honey
- apiary trips
- bee brood as food

○ At some point, Trainees may need to go to the local market to purchase supplies for the Fair. If practical, also have them purchase the food supplies they will need for Session 48, "Cooking with Honey".

○ As one aspect of their preparation activities, make sure that the Trainees appoint a facilitator and design an approach for the Bee Fair evaluation.

○ Note that Session 50, "Future Training Needs" and Session 52, "Final Program Evaluation" also call for a Trainee-facilitator. In order to allow for preparation and briefing, select those facilitators at this time.

Handout 39A

Guidelines for Preparing for the Bee Fair

○ Everyone should participate fully in preparing for the Fair.

○ In keeping with the overall goal of providing the opportunity to creatively use skills acquired during the program, the role of the training staff will be limited to providing guidance and advice. Everyone should have the opportunity to be responsible for all aspects of the Fair.

○ The Fair should consist of a series of method demonstrations and/or activities related to beekeeping which would be of interest to the surrounding community.

○ Each of you will be responsible for preparing and presenting at least one method demonstration on the day of the Fair.

○ The Fair should be designed to last four to six hours.

○ Throughout the activities of the Fair, there should be an emphasis on the integration of the themes presented during the training program.

○ Everyone will be responsible for food, fuel, water and other necessary materials or supplies.

○ Information should be available to all guests and community members.

○ Music, games and food should be an integral part of the Fair.

○ A schedule of events should be developed and made available to all participants and guests.

○ Following the Bee Fair, the group will be responsible for designing and implementing a structured evaluation of the effectiveness of the Fair.

SESSION 40

BEESWAX FIELD TRIP

TOTAL TIME 4 hours

OVERVIEW Beeswax has many commercial uses. An understanding of the commercial potential of beeswax enhances one's knowledge concerning the marketing and the value of this hive product. This session provides the Trainees with the opportunity to observe both a use of beeswax and a local business. It provides technical information while giving the Trainees a chance to develop cross-cultural skills.

OBJECTIVES

- To observe a commercial use for beeswax.
- To observe a local business.
- To observe a traditional craft that uses beeswax (Africa).
- To interact with a commercial supplier of the local beekeeping industry (Inter-America).

RESOURCES

- Small Scale Beekeeping, pp. 127-130, 207-209.
- The Hive and the Honey Bee, pp. 537-545.
- Beekeeping in Rural Development, pp. 185-189.

PROCEDURES

Trainer Note

○ This session requires considerable advance preparation. Arrangements include: locating the shop to be visited, discussing details with the proprietor and obtaining transportation.

○ In the African region, a trip to a cloth batiking shop, or to a lost-wax metal casting shop may be possible. In the Inter-American region, a trip to a shop where comb foundation is made is suggested.

○ Note that Session 41, "Bees and Trees" is also a field trip and has been scheduled for the same day so that the same transportation may be used.

Step 1: **Field Trip (4 hours)**

Take a field trip to observe a commercial use for beeswax. While en route, discuss with the Trainees the objectives for this field trip and how to best meet these objectives.

Once at the destination, assist the Trainees in interviewing the proprietor of the operation. Points to consider are:

- source of the beeswax used,
- quality standards and control,
- procedures used,
- cost of materials,
- markets available for products,
- problems in marketing and
- price of finished products.

After leaving, review with the Trainees:

- any important technical insights which occurred,
- any important cross-cultural insights which occurred and
- any conditions which were observed that might limit beekeeping/agricultural development.

SESSION 41

BEES AND TREES

TOTAL TIME 4 hours

OVERVIEW Beekeeping often plays a part in multi-purpose forestry programs. Some beekeeping volunteers may work with forestry agencies and some may find skills in establishing tree nurseries useful while working with other agencies. This session gives the Trainees an opportunity to observe what is involved in establishing and maintaining a tree nursery. The information and skills gained from this session will aid in increasing the credibility of Trainees who will work with forestry agencies. Also, this session will provide all Trainees with a functional basis for integrating beekeeping with another activity.

OBJECTIVES

- To discuss the role of a tree nursery in a beekeeping program.
- To discuss the principles of establishing and maintaining a tree nursery.
- To interview people familiar with different tree nurseries.
- To visit a tree nursery (an option).
- To examine the concept of village wood lots (Africa).

RESOURCES

- Forestry Training Manual
- Reforestation in Arid Lands
- Firewood Crops: Shrubs and Tree Species for Energy Production

MATERIALS As determined by the situation.

PROCEDURES

Trainer Note

○ The purpose of this session is to provide an overview of establishing and maintaining a tree nursery and to relate its role to a beekeeping project. The approach and location of this session will vary greatly depending on the area and the facilities and personnel available.

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○ If a tree nursery or village wood lot is in the area, this is an opportunity for a field trip. Consideration might also be given to having a consultant or having a Trainee, who has experience in forestry or agriculture, conduct this session. Sessions, 10, 13, 16, 18, 20, 32 and 60, from the Peace Corps' Forestry Training Manual - Inter-America Region, provide a guide for the content to be included in this session.

○ This session is scheduled on the same day as the "Beeswax Field Trip" so that the same transportation may be used.

Step 1: **Introduction to Bees and Trees** (30 minutes)

Discuss the objectives of this session. Have the Trainees develop reasons why and how this session fits into their training program. Consider that:

- Beekeepers are interested in protecting forest resources.
- Beekeeping programs are often under the auspices of forestry agencies, in many countries.
- Bees and trees interrelate.

Step 2: **A Tree Nursery** (3 hours, 30 minutes)

Have the Trainees observe and discuss what inputs are necessary to establish and maintain a tree nursery. Allow them to practice their interviewing techniques to ascertain:

- What are the uses of the trees in the nursery?
- Which tree species grown in the nursery are visited by bees?
- Who is served by the tree nursery?

SESSION 42

PROJECT PLANNING AND DEVELOPMENT

TOTAL TIME 4 hours

OVERVIEW The skills necessary to plan and monitor development projects are essential to Peace Corps Volunteers. Development workers are often involved in both small and large-scale projects; in both cases, careful needs assessment, planning, supervision and evaluation are factors which must be addressed. In this session, Trainees will practice these skills by conducting a beekeeping development feasibility study and by designing a beekeeping in-service training workshop. Both of these activities will help prepare the Trainees for their future work situation as Peace Corps Volunteers.

OBJECTIVES

- To examine factors which influence the designing, planning and implementing of beekeeping development projects.
- To identify reasons why beekeeping can be an effective development tool.
- To identify aid agencies, resource centers and books pertinent to beekeeping development.
- To discuss the role of the Peace Corps Volunteer in beekeeping development.
- To plan and design a feasiblity study for beekeeping development and an In-Service Training for beekeeping as a secondary activity for Peace Corps Volunteers.

RESOURCES

- Technical Cooperation Activities: Beekeeping, pp. 11-12, 151-162.
- Small Scale Beekeeping, pp. 6-18, 177-188.
- Apiculture in Tropical Climates, pp. 191-197.
- Source Materials for Apiculture, # 6 and #10.

MATERIALS newsprint, markers, pencils and paper

PROCEDURES

Step 1: **Introduction** (15 minutes)

Review the objectives of the session. Ask the Trainees to discuss the importance of careful project planning and supervision in their future roles as Peace Corps Volunteers. Mention that Session 49, "Introducing Innovation - Expectations Beyond Training" will also focus on the nature of Peace Corps service.

Trainer Note

○ It is important that the Trainees begin to understand clearly that a variety of potential roles exist for them as Peace Corps Volunteers in beekeeping development work.

Step 2: **Why Beekeeping Projects?** (30 minutes)

Have the Trainees list and discuss reasons why beekeeping programs are considered viable projects for developing countries.

Step 3: **Small Group Exercise** (1 hour, 15 minutes)

Divide the Trainees into two groups. Each group will have a different task and will present their results to the other group.

Have one group plan a feasibility study to determine whether beekeeping development is suitable for a given area. Provide instructions to this group by suggesting major topics to consider and then let the Trainees compose the specific details to examine with the feasibility study. Remind the Trainees to include marketing possibilities and strategies in their study.

Have the second group design a 5-1/2 day In-Service Training workshop for Peace Corps Volunteers interested in beekeeping as a secondary activity. These Trainees need to develop a schedule as well as list the set-up tasks and determine the equipment which is necessary. Remind this group to consider the skill and interest level of the participants when they design and establish the format for the workshop.

Trainer Note

- ○ Divide time between each group to offer aid and advice when necessary. Help the Trainees to maintain realistic perspectives and expectations. Remind them to use the information on the bee-human relationship which they gathered on their site visits.
- ○ Marketing hive products is an important, though often overlooked, aspect in planning a beekeeping development project. Be sure that the Trainees consider this in their feasibility study. Stress developing local markets instead of export markets. Introduce the idea of cooperatives for both supplying beekeeping equipment and marketing hive products.

Step 4: **Presentation of the Feasibility Study** (30 minutes)

Have the feasibility study group explain their task and present their results to the other Trainees.

Step 5: **Project Implementation Guidelines** (30 minutes)

Based on the results presented in Step 4, have all of the Trainees participate in developing a list of general guidelines for implementing a beekeeping project.

Again, keep the Trainees' expectations realistic to the scale at which they will be working.

Mention that project evaluation will be discussed in Session 45, "Cost Analysis and Project Evaluation".

Step 6: **Presentation of In-Service Training Program** (30 minutes)

Have the In-Service Training Program group explain their task and present their results to the other Trainees. Following the presentation of the results, encourage discussion and answer any questions.

Step 7: **Available Funding and Resources** (30 minutes)

Point out various aid agencies which have been involved in beekeeping development in the areas where the Trainees will be working. Also, suggest useful beekeeping books and resources which are available to those working in beekeeping development.

SESSION 43

CREAMED HONEY AND BEESWAX PRODUCTS

TOTAL TIME 4 hours

OVERVIEW

Producing creamed honey is a simple and inexpensive process which greatly increases the market value of honey. This session acquaints the Trainees with this product and gives them experience in making it.

Beeswax is a high-value hive product. In some situations, its value is unrecognized, while in other situations poor handling and processing techniques often lead to income lost by the beekeeper. This session explores the handling, processing and marketing of beeswax and beeswax products. Quality standards are discussed and the Trainees gain experience in making beeswax products.

OBJECTIVES

- To prepare creamed honey.
- To discuss the uses and marketing of beeswax.
- To examine quality standards for beeswax.
- To prepare beeswax for market.
- To demonstrate methods of processing and storing beeswax.
- To prepare beeswax products.
- To practice giving method demonstrations.

RESOURCES

- Preparation of Honey for Market, pp. 22-24.
- Small Scale Beekeeping, pp. 155-158, 207-209.
- The Hive and the Honey Bee, pp. 537-546.
- Beekeeping in Rural Development, pp. 185-189.

MATERIALS

cheese cloth, previously extracted honey, finely crystallized honey, cooking thermometer, funnel, towels, cooking pots, large mouth jars, old comb, enamel or aluminum pot (size depends on amount of comb to be rendered), fuel for fire, screen wire strainer, knife, water, burlap bag, rocks, stirring stick, ingredients to make beeswax products and containers (the ingredients and type of containers depend upon which products will be made; see Small Scale Beekeeping, pp. 207-209)

PROCEDURES

Step 1: **Preparing Creamed Honey and Beeswax Products** (4 hours)

Have the Trainees who previously volunteered to facilitate these activities (Session 37, "Other Hive Products") take charge. The activities should include:

- making creamed honey
- rendering old comb by different methods
- making various beeswax products (the beeswax furniture/wood polish and the beeswax cold cream are simple and the ingredients are readily available in most areas).

Move among the Trainees and offer suggestions and encouragement. Remember to give the Trainees the freedom to experiment. Point out that beeswax should not be allowed to boil. Remind the Trainees of the fire danger in working with liquid beeswax.

Facilitate discussions on the uses, quality standards and marketing of these products.

Trainer Note

○ There will be a number of activities going on at the same time during this session. While it is not important that each Trainee participate directly in each activity, it is important that everyone sees and understands the processes involved in all of the activities. This provides the opportunity for the Trainees to practice method demonstrations with their peers.

○ These activities are also very amenable to being included in the Bee Fair. Any Trainees who would like to have more time to make creamed honey or beeswax products can prepare samples for the Bee Fair.

○ If a Lorena stove or other similar wood-conserving cook stove is available at the training center, it should be used for these activities.

○ Both creamed honey and beeswax products are nice gifts for individuals in the training community who have been helpful during the training program.

SESSION 44

INTRODUCTION TO FINAL ASSESSMENT

TOTAL TIME 1 hour

OVERVIEW The on going system of Trainee assessment will draw to a close in the last week of the program. This requires careful coordination among all staff and Trainees. This session provides a forum for clarifying the timing and procedures such that all final counterpart sessions and recommendations can be completed by the time the Trainees depart.

OBJECTIVES

- To clarify the goals of the final assessment process.
- To define and discuss the procedures for completing the final assessment process.

RESOURCES - Copies of the "Self-Assessment Form" for each Trainee

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ Prior to this session, write on newsprint the "list of procedures" described in Step 1.

Step 1: **Final Assessment Procedures** (30 minutes)

Begin by reviewing the objectives and explaining the goals of the final assessment process. Explain that one goal of the process is to develop a written, final recommendation which states the opinion of the training staff regarding each Trainee's suitability for continuing with in-country training. Provide an explanation of the timeline and procedures for the final assessments. Post and explain the following list of procedures:

- Trainees develop a cumulative self-assessment and complete the third and final "Self-Assessment Form".
- Trainers write similar assessments using the "Trainer Assessment Forms".
- During the final counterpart session, Trainees and staff discuss and clarify their perspectives.

- Following the discussion, Trainees are asked to sign final recommendations.
- Copies of all written assessments and the final recommendations are made available to Trainees, to the training staff and to Peace Corps.

Trainer Note

○ Due to commitments arising from preparation for the Bee Fair, the timeline for carrying out the final assessment process should remain flexible and responsive to the needs of both Trainees and staff. All final interviews should be completed no later than the fifth day of the final week. This will allow ample time for processing the final recommendations prior to the departure of the Trainees. The schedule of events provided in the six-week schedule is intended as a recommended layout. Note that these final counterpart sessions are scheduled to take place concurrently with Session 51, "Site Restitution". Since Trainees will be working independently during most of that day, they can participate in the counterpart session without disrupting the flow of that session's activities.

Step 2: **Final Counterpart Sessions** (30 minutes)

Distribute a copy of a "Self-Assessment Form" to each Trainee. Ask that, in completing these final assessments, Trainees provide succinct, cumulative statements and identify specific skill areas which they would like to continue to work on during their in-country training. Have the Trainees sign up for one-hour periods during which their final counterpart session will be conducted. Explain that this counterpart session should be a dialogue between Trainees and staff in which the final cumulative assessments and the resultant recommendations are negotiated mutually. Answer any questions and clarify any remaining doubts regarding the final assessment process.

Trainer Note

○ Prior to the counterpart sessions, the staff should discuss and arrive at an agreement regarding the recommendation for each Trainee. These recommendations should be written in advance so that they are ready to be signed during each counterpart session. The content and format of these recommendations will vary according to the needs of each training program.

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○ At the close of the program, copies of the three "Self-Assessment Forms", the three "Trainer Assessment Forms" and the "Final Recommendation" for each Trainee should be sent to the appropriate Peace Corps representatives in-country and/or Washington, D.C.

SESSION 45

COST ANALYSIS AND PROJECT EVALUATION

TOTAL TIME 3 hours

OVERVIEW

Analyzing costs permits a beekeeper to determine the success or failure of a beekeeping venture. Beekeeping extentionists cannot expect a project to be successful if they promote a beekeeping system which local farmers are unwilling or unable to maintain. Consideration must be given to many factors; each beekeeping system has specific cost/benefit advantages and disadvantages.

This session enables the Trainees to conduct a sample cost/benefits analysis and to develop an instrument to evaluate the cost/benefits of future projects.

OBJECTIVES

- To determine the cost of mounting sample beekeeping projects.
- To analyze and evaluate criteria for determining the relative cost/benefits of small-scale projects.
- To develop an instrument for evaluating the cost/benefits of small-scale beekeeping projects.
- To compare and contrast the relative merit of direct one-way aid to rotating loan systems.
- To identify potential fund-raising techniques for rural communities.

RESOURCES

- Environmentally Sound Small Scale Agricultural Projects, Chapter 8.
- Apiculture in Tropical Climates, pp. 191-197.

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ This session is scheduled to occur near the end of the training period. By this time, the Trainees will have a "feel" for the economic and social milieu existing within the host country and, therefore, can contribute to the discussion, brainstorming and analysis of this session.

○ Prior to the start of the session, list on newsprint the "Cost/Benefits Analysis Criteria" given in Step 2.

Step 1: **Cost Analysis of Beekeeping Systems** (1 hour)

Briefly discuss cost analysis and its use as a tool for evaluating projects. Have the Trainees find out the costs of starting beekeeping projects with KTBH's and with Langstroth hives. Suggest that they divide up the tasks and use notes from their purchases and interviews with local beekeepers.

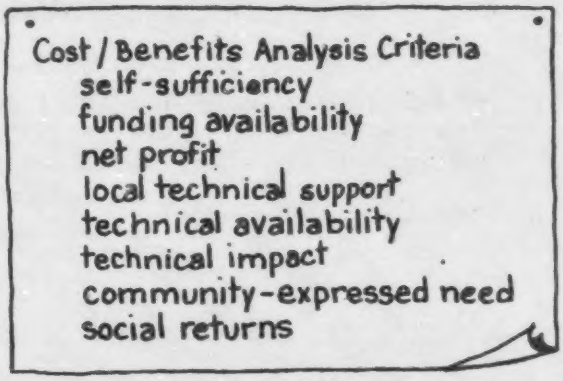
Be sure that they determine both the potential and actual annual income of local small-scale beekeepers. Also, stress the importance of taking into account the cost of gloves, wood, frames, smokers, frame wire, hive bodies, hive tools, extractors, veils, solar wax melters, foundation, bees, nucs, queens, and the buying and selling price of honey, beeswax and pollen.

Step 2: **Presentation of Findings** (30 minutes)

Reconvene the whole group and have them present their findings. Focus the discussion on the appropriateness of the various findings in regards to the income of small-scale beekeepers. During the discussion, identify and describe alternate resources which could substitute for some of the more expensive equipment.

Step 3: **Project Evaluation** (45 minutes)

Post the following:



Cost / Benefits Analysis Criteria
- self-sufficiency
- funding availability
- net profit
- local technical support
- technical availability
- technical impact
- community-expressed need
- social returns

Guide the Trainees in ranking the criteria based on their appropriateness to beekeeping development projects. Discuss the specific factors to consider under each criterium and explain that considering these criteria can provide important insights as to the success or failure of a small-scale beekeeping project.

Step 4: **Grants versus Loans for Project Funding**
(45 minutes)

Question the Trainees about their thoughts concerning the pros and cons of direct one-way aid (grants) versus a system of rotating loans for beekeeping development projects. Ask them to identify ways to ascertain the level of interest and/or commitment of beginning beekeepers in order to determine their potential as credit risks.

Have the Trainees identify various ways to raise money for small-scale beekeeping projects within a rural community. Emphasize the importance of involving everyone in all stages of a fund-raising effort.

SESSION 46

BEE DISEASES AND PESTS

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW The recognition and control of bee diseases and pests is an integral part of beekeeping. This session explores the causes and symptoms of bee diseases, the common pests of bees and the control of these diseases and pests. Trainees will discuss disease and pest problems in bee colonies and will examine practical approaches for helping small-scale beekeepers recognize, prevent and eradicate these colony problems.

OBJECTIVES

- To discuss the causes of bee diseases.
- To point out the symptoms of major bee diseases.
- To examine methods of controlling diseases and pests.
- To observe examples of healthy brood comb.

RESOURCES

- The Hive and the Honey Bee, Chapter 21.
- Beekeeping in the United States, pp. 118-128.
- Honey Bee Brood Diseases
- Small Scale Beekeeping, pp. 161-172.
- Identification and Control of Honey Bee Diseases
- Nosema Disease
- "Preliminary World Maps of Honey Bee Diseases and Parasites"

MATERIALS pictures of honey bee diseases and pests (or slides), empty comb, brood boxes, newspaper, flour paste, sulfur, alcohol, matches, jar lids, tetracycline, sugar

PROCEDURES

Step 1: **Causes and Symptoms of Bee Diseases** (45 minutes)

Discuss the causes and symptoms of bee diseases. Pass around copies of Honey Bee Brood Diseases. Have the Trainees develop a list or chart for disease differentiation from pictures in the book (and/or from slides). Emphasize comparing symptoms of the diseases and making a diagnosis from the total disease picture. Demonstrate healthy brood and review how to distinguish this situation from diseased brood.

Step 2: **Control of Diseases** (45 minutes)

Have the Trainees brainstorm a list of potential problems of effective bee disease control among small-scale farmers. Have the Trainees recall the factors which cause and transmit diseases from Session 25, "Health and Hygiene". Include for consideration the problems of disease recognition/ differentiation, following directions correctly and access to treatment. Recall any specific examples or instances that may have been observed during visits to beekeepers.

Emphasize that treatment for brood diseases differs from that of adult diseases; also, that antibiotics are only effective in treating those diseases caused by bacteria. Discuss and demonstrate methods of honey bee disease control while passing around samples of medicines. Be sure to include how beekeepers can sanitize their clothing and equipment to prevent spreading diseases. Explain how to differentiate starvation from disease symptoms. Remind Trainees of the possibility of mailing diseased samples to laboratories for verifying field diagnoses.

Step 3: **Recognition and Control of Honey Bee Pests** (15 minutes)

Use photographs and samples of infested comb to demonstrate honey bee pests. Discuss and demonstrate methods of pest control. Include the storing of drawn comb to prevent wax moth damage.

Step 4: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

SESSION 47

INSECTICIDES AND BEES

Trainer Note

○ This is a Trainee-facilitated session. See Session 7, "Bee Colony Cycle", for guidelines.

TOTAL TIME 2 hours

OVERVIEW

Insecticides kill bees. The proper application of the appropriate insecticide will minimize the damage done to nearby bee colonies. At times, the beekeeper will need to educate neighboring farmers about insecticides and their negative impact on the bee colony.

A Peace Corps Volunteer is often viewed as a resource for the community. As such, familiarity with insecticides and their use and misuse is important if the Volunteer is to provide good advice. In this session, Trainees develop the familiarity necessary to recognize and reduce pesticide damage to bee colonies.

OBJECTIVES

- To examine problems and abuses common to pesticide use.
- To recognize and describe the symptoms of pesticide poisoning in bees.
- To list socio-economic factors which influence pesticide selection in developing countries.
- To describe techniques for applying pesticides which reduce damage to bee colonies.

RESOURCES

- Beekeeping in the United States, pp. 129-140.
- Pesticides and Honey Bees
- Insect Pollination of Cultivated Crop Plants, pp. 49-57.
- The Hive and the Honey Bee, Chapter 22.
- Small Scale Beekeeping, pp. 173-175.

MATERIALS blackboard, chalk, live bees in small containers, examples of pesticides

PROCEDURES

Step 1: **Insecticide Use and Misuse** (25 minutes)

Explain the role of pesticides in agriculture. Examine the problems and abuses common to pesticide usage in developing country situations. As the basis for this discussion, have the Trainees describe any problems or abuses they have seen in the training site community or in the United States.

Step 2: **Symptoms of Pesticide Problems** (25 minutes)

Apply a variety of pesticides to samples of bees in small glass jars. Pass the jars around among the Trainees. As the pesticides begin to affect the bees, have the Trainees describe the symptoms they see. Write their responses on newsprint. Discuss the symptoms in detail and explain how they may easily be confused with other problems in the colony.

Step 3: **Pesticide Selection** (25 minutes)

Ask the Trainees to generate a list of socio-economic factors involved in selecting a pesticide in developing countries. Write the list on newsprint. Stimulate responses and provide focus by suggesting such factors as:

- directions written in English, in a non-English speaking country,
- the selling of a pesticide outlawed or regulated in the country where it is manufactured,
- the selection of a pesticide due to cost, rather than the pest to be eradicated,
- the selection of a pesticide used successfully in the past, even though a safer one has been developed.

Step 4: **Pesticide Application** (30 minutes)

Discuss the proper way to apply pesticides so as to minimize damage to bees. Ask Trainees to describe techniques for applying pesticides if they have experience in doing so. Discuss what precautions need to be taken from the point of view of the applicator, as well as for the bee colonies.

Present Trainees with different scenarios and have them respond as a group with their solutions to each problem. For each scenario, have them identify the potential problem or danger; describe the cause of the problem; and explain the steps necessary to correct it.

Trainer Note

○ Some potential scenarios include: (a) applying insecticides on the ground around the colony to control ants; (b) spraying a rich farmer's fields which are upwind from a poor farmer; or (c) spraying repeatedly a long-blooming, highly bee-attractive crop (such as cotton).

Step 5: **Session Evaluation** (15 minutes)

Trainer Note

○ See Steps 5 and 6 of Session 7, "Bee Colony Cycle".

SESSION 48

COOKING WITH HONEY

TOTAL TIME 5 hours

OVERVIEW

Honey is most commonly used as food. Preparing a meal using honey gives the Trainees experience using this primary hive product. Furthermore, by using local foods, the Trainees gain experience with different ways to prepare these foods.

In this session, working as a group, the Trainees will prepare a nutritionally complete meal. This experience will reinforce the role of nutrition in their own well-being as well as provide an opportunity for them to practice and acquire cooking skills.

OBJECTIVES

- To prepare a meal using common local foods.
- To use honey as a substitute for sugar in recipes.
- To use complementary protein theory in preparing a meal.
- To practice using wood-conserving cook stoves.

RESOURCES

- A Book of Honey
- The Hive and the Honey Bee, pp. 517-524.
- recipes of local foods
- Handout 48A, "Guidelines for Cooking with Honey" Handout 48B, "Menu and Recipes"

MATERIALS cooking stove, kitchen and eating utensils, meal menu with recipes (one for each Trainee)

PROCEDURES

Trainer Note

○ This session may vary considerably because of different facilities available in various training situations. Ideally, the Trainees should use a wood-conserving cookstove to prepare the meal. If such a stove is not available, a cook stove similar to those used locally should be used.

○ The menu may also vary depending upon the availability of certain foods. The attached menu was used in Costa Rica. Fish was chosen in order to give those Trainees who were unfamiliar with cleaning and preparing fish an opportunity to gain those skills.

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- ○ If practical to the training situation, the Trainees themselves should participate in planning the menu and in purchasing the food to be prepared.
- ○ This session runs through the normal lunch period. It begins in the morning and ends one hour after the lunch period.

Step 1: **Introduction** (15 minutes)

Discuss the "rules of the kitchen". Relate the menu selection and the preparation of food to Session 15, "Basic Nutrition". Point out the use of the complementary protein theory in the menu selection.

Step 2: **Uses of Honey in the Kitchen** (20 minutes)

Ask the Trainees to relate any uses of honey, in cooking, which they have experienced. Ask them if they know any tips or guides for using honey when cooking. Distribute Handout 48A, "Guidelines for Cooking with Honey". When the Trainees have looked it over, answer any questions they might have.

Step 3: **Food Preparation** (2 hours, 30 minutes)

Have the Trainees divide into groups with each group in charge of preparing one recipe. Encourage those Trainees with cooking skills to share their talents with others in the group.

Step 4: **Eating** (1 hour)

During the meal, encourage informal discussion among the Trainees about their experiences with the recipes and with the cookstoves. Enjoy!!

Step 5: **Clean up** (55 minutes)

Have the Trainees clean up the kitchen area and wash the utensils and dishes.

Trainer Note

- ○ If this session takes more than the allotted five hours, a "Bee Management Techniques" session is scheduled afterwards in order to provide some extra time.

Handout 48A

GUIDELINES FOR COOKING WITH HONEY

- ○ To measure honey, grease the measuring cup or spoon so that the honey will slip off easily, or measure the shortening first for the recipe, or heat the cup with hot water before measuring.

- ○ To substitute honey for sugar, use 1 cup honey for 1-1/4 cup sugar and reduce the liquid in the recipe by 1/4 cup.

- ○ To neutralize the acidity of honey -- unless sour milk or sour cream is called for in the recipe -- add a pinch of baking soda.

- ○ To substitute honey for sugar in jams, jellies or candies, use a higher degree of heat when cooking.

- ○ To prevent a product from becoming too brown, be careful not to use too much honey in the recipe.

- ○ To prevent the absorption of atmospheric moisture in candies made with honey, beat the mixture more persistently and store the candy carefully.

- ○ To use honey to make bread, remember that the loaf will be more moist than one made with sugar, corn syrup, cane syrup, maple sugar or molasses as a sweetener. The more honey you use, the more moist your bread will be and the longer it will keep. Honey is hygroscopic; it absorbs moisture fom the air and holds this moisture in the bread.

Handout 48B

MENU

Hors d'oeuvres: Sauteed Bee Brood

Fish with Honey-Lemon Sauce

Rice, cooked in Coconut Milk

Chayote Casserole

Cassava Patties

Salad

Baked Ripe Plantains

Honey-Butter Sauce

Lemon Refresher

RECIPES

Sauteed Bee Brood

Remove brood from comb and saute it. Older drone pupae work best for this as they are larger and do not shrink as much.

Fish with Honey

Rub with salt, thyme, pepper and honey. Top with lemon juice. Fry in hot oil. Remove and dot with butter or Honey-Butter Sauce.

Baked Chayote Casserole

3 chayotes, peeled and halved
salt
3-1/2 cups freshly made breadcrumbs
2 cups white cheese - grated
freshly ground pepper
2 eggs lightly beaten
butter

Parboil the chayotes in salted water 10-15 minutes. Drain. Chop the vegetables coarsely and mix with 3 cups of the breadcrumbs, the cheese, the eggs and the salt and pepper. Pile into a buttered mold and bake for 15-20 minutes or until the dish is heated through and the top nicely browned.

Cassava Patties
2-1/2 cassava
1 cup grated cheese
salt to taste
2 tb. honey
1 egg
lard or oil

Boil and mash the cassava. Add the rest of the ingredients, form patties and fry until browned in hot oil.

Baked Ripe Plantains
Peel ripe plantains, split and place in a well-buttered mold. Top with cinnamon and honey. Bake until brown.

Honey - Butter Sauce
1/2 cup butter
1/3 cup honey
1 tsp. lemon juice
--- or more to taste ---

Cream the butter and gradually beat in the honey. Add the lemon juice slowly and blend until smooth.

Lemon Refresher
- lemons
- ice
- water
- honey

Coconut Milk
Drain and preserve the liquid. Put the coconut on a hard surface and hit it all over with a hammer. The hard shell will break and fall away. When making coconut milk, it is not necessary to peel off the brown inner skin. Grate as fine as possible.

To make thick (rich) coconut milk, squeeze the grated coconut through a damp cloth, squeezing and twisting the cloth to remove as much liquid as possible. To make ordinary coconut milk, put the squeezed - out coconut into a bowl and pour 1 cup boiling water over it. Let it stand 30 minutes. Squeeze out the liquid through a damp cloth, add the coconut water and set aside. Repeat the entire process. Discard the coconut.

Coconut milk can be used to enrich and add taste to foods such as rice, breads and casseroles.

SESSION 49

INTRODUCING INNOVATION – EXPECTATIONS BEYOND TRAINING

TOTAL TIME 2 hours

OVERVIEW Introducing technological innovation is a very complex task. It does not lend itself to being broken down into component parts and practiced in a single session. At this point in the program Trainees have begun to shift their focus from the immediate environment of the training center to their in-country assignments. This session is designed as a panel discussion to allow Trainees to share ideas with several experienced development workers about how best to introduce innovation and about what their lives may be like as Peace Corps Volunteers.

OBJECTIVES

- To discuss and clarify expectations regarding the life of a Peace Corps Volunteer.
- To discuss some specific techniques and potential difficulties involved in introducing new beekeeping practices.

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ This session will require considerable preparation in the following major areas:

Trainee/Facilitator - This session is an excellent opportunity for a Trainee to practice facilitation skills. If you ask one of the Trainees to facilitate, provide a thorough overview of the session in advance. Also, be certain to allow time at the end of the session to give feedback on the facilitation skills.

Panel Discussion - Step 2 of this session calls for the participation of three to five guest panelists. Ideally, these panelists should be currently involved in beekeeping development work and should represent a variety of perspectives (such as: agency level work, Peace Corps work, or work with women/men). You will need to select, invite and orient these panelists well in advance of the date of the session.

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Step 1: **Introducing Innovation/Peace Corps Volunteer Life Styles**
(40 minutes)

Present a brief introductory overview of the session objectives and procedures. Have the Trainees generate a list of five to six questions which will help focus the panel discussion. Emphasize the importance of keeping these questions general in nature so as to promote spontaneity and dialogue among the panelists. Explain that the discussion should remain within the broad limits of introducing beekeeping technology and of life as a Peace Corps Volunteer. Help to stimulate the Trainees' responses by suggesting the following questions:

- What are some of the difficulties which a beekeeping Volunteer may encounter in introducing innovations when dealing with local values, beliefs and organizational policies?
- What are effective techniques in introducing innovations?
- How can a Volunteer work to improve existing indigenous beekeeping technologies?
- In what secondary projects might a beekeeping Volunteer become involved?
- What types of support might a beekeeping Volunteer expect from the host agency? the Peace Corps? the community?
- How can the Volunteer life style be described? (e.g., jobs, housing and social life)

Write the questions on newsprint and post them. Announce a short break and explain that the panel discussion will begin immediately after the break.

Trainer Note

○ During the break:

- Arrange the room such that the panelists are seated where they can see both the posted questions and the Trainees.
- Greet the arriving guest panelists and provide them with a brief overview of the proposed discussion questions.

Step 2: **Panel Discussion** (1 hour)

Reconvene the group and have each of the panel members introduce themselves. Ask each panel member to briefly describe their roles, positions and duties as development workers. Open the panel to questions from the Trainees. Keep the discussion centered around the list of questions developed in Step 1.

At the end of the time allotted for this activity, thank the panelists for their participation. Announce that following a ten-minute break the Trainees will reconvene in order to summarize the session's activities.

Trainer Note

○ During this break, you may find that certain participants and panelists will wish to continue to talk informally. If this dialogue seems animated and fruitful, prolong it and schedule Step 3 for the beginning of the next session.

Step 3: **Summary and Conclusion** (20 minutes)

Reconvene the group. Refer to the questions developed during Step 1 and ask the Trainees to discuss any general conclusions or insights provided by the panelists.

SESSION 50

FUTURE TRAINING NEEDS

TOTAL TIME 2 hours

OVERVIEW It is important that Trainees continue to take an active part in helping to design their training. This participation not only makes training a more meaningful experience, but it also enables Trainees to practice training design, group dynamics and project planning skills. As a link between participation in this program and participation in in-country training, this session enables Trainees to develop a list of their perceptions of their future training needs. The session is designed to carry out two processes at the same time. Trainees will be called upon to plan, design and implement a training activity while simultaneously identifying their in-country training needs.

OBJECTIVES

- To develop a written list of in-country training needs.
- To plan, design and implement a training activity.

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

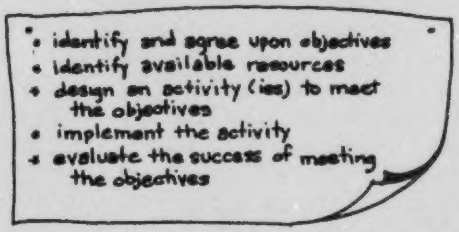
○ Prior to beginning this session, write on newsprint the "activity design format" provided in Step 2.

Step 1: **Introduction/Orientation** (10 minutes)

Begin by explaining the session objectives and reviewing the procedures. Remind Trainees that their training will be continuing in their assigned countries. Point out that, as a result of their experiences in this program, they are in a position to improve their in-country training by helping to identify and clarify their perceived future training needs. Explain that this session is designed to carry out two processes simultaneously. Trainees will plan and carry out an activity which has as its objective the development of a written list of in-country training needs. In this way, Trainees practice planning, designing and facilitating while simultaneously identifying their in-country training needs. Enccurage questions and discussion.

Step 2: **Designing a Training Activity** (40 minutes)

Post the following activity design format:



- identify and agree upon objectives
- identify available resources
- design an activity (ies) to meet the objectives
- implement the activity
- evaluate the success of meeting the objectives

Explain that in the remainder of this session Trainees will use this format to develop a written list of their perceived future training needs. Assist them in clarifying this objective and designing the procedures to be followed. Mention the importance of outlining the procedures in a step-by-step manner. Suggest that time limits be set and that a facilitator be chosen.

Trainer Note

⬡ If the program includes Trainees bound for more than one country, have them divide up according to country to carry out this activity.

Step 3: **Implementing the Activity** (55 minutes)

Have the Trainees carry out their planned procedures for developing the lists of their in-country training needs.

Step 4: **Evaluation/Conclusion** (15 minutes)

Conclude the session by soliciting feedback regarding how well the objectives were met. Focus the feedback on the group's effectiveness at identifying their future training needs as well as on their effectiveness in planning and implementing the activity. Encourage discussion by asking the following questions:

- Were in-country training needs clearly and completely identified?
- Was the activity well designed? If so, how? If not, how could it have been improved?
- In carrying out the activity, were the procedures followed?
- What were some things which the facilitator did to help the process? What did he or she do which hindered the process?

Ask the Trainees to keep their lists of future training needs. Explain that they should present and explain these lists to the in-country training staff as soon as they arrive.

SESSION 51

SITE RESTITUTION

TOTAL TIME 8 hours

OVERVIEW At the end of the training program, the site will need to be cleaned up. Also, the bee colonies will need to be prepared for whatever has been decided for them.

In this session, the staff and Trainees work together, as a group, to decide what needs to be done before departure. Once decisions have been reached, Trainees are to work independently or in groups to accomplish the tasks.

OBJECTIVES

- To clean up and organize the training site.
- To disassemble and/or store equipment used during the training program.
- To prepare the bee colonies for closing down the training site.

RESOURCES – As needed

MATERIALS As needed

PROCEDURES

Trainer Note

○ Ask one of the Trainees to facilitate Step 1. All of the staff should be on hand to provide assistance and advice, as needed, during this planning phase.

Step 1: **Planning Site Restitution** (1 hour)

Have the Trainees work together to plan what needs to be done to the site, with the bee colonies and with any beekeeping equipment. Be sure that they include the following tasks in their plan for restoring the site:

- preparing the observation hives for a little or no management state,
- combining nucs and small colonies to make sure that enough reserves are on hand to survive a dearth period,

- gathering together all equipment,
- storing all supplies and equipment in an appropriate location,
- collecting all library books or resource materials and
- cleaning and organizing the training site.

Step 2: **Site Restitution** (7 hours)

Have the Trainees carry out their plans made in Step 1.

Trainer Note

○ This step is scheduled to occur concurrently with the Final Counterparts (see Session 44, "Introduction to Final Assessment"). Each counterpart session will require approximately one hour. Trainees will need to plan their activities such that they can attend these final assessment sessions.

SESSION 52

FINAL PROGRAM EVALUATION

TOTAL TIME 4 hours

OVERVIEW The purpose of this session is to examine the results of the program and to evaluate how well the training achieved its stated goals. This evaluation will help to determine when and how to use similar approaches in the future. During this session, Trainees will carry out two processes simultaneously. They will be called upon to plan, design and implement a training activity while, at the same time, evaluating the training program.

OBJECTIVES

- To evaluate (both verbally and in writing) the overall effectiveness of the training program.
- To plan, carry out and evaluate a training activity.

RESOURCES – Handout 32A, "Evaluation Questionnaire"

MATERIALS newsprint and markers

PROCEDURES

Trainer Note

○ Ask a participant to volunteer to facilitate this session. Be certain to brief him or her in advance and allow time at the end of the session for feedback on the facilitation skills demonstrated.

○ Prepare on newsprint a chronological list of all sessions in the program and a list of the names of all the trainers that participated in the program. Have these lists on hand as a potential resource for use in planning the evaluation activity in Step 2.

Step 1: **Introduction/Orientation** (15 minutes)

Review the session objectives and explain that the purpose of this evaluation is to provide feedback which can be used in improving the design and implementation of future training programs. Explain that the design of the session is intended not only to evaluate the training program but also to provide Trainees with the opportunity to plan and carry out a training activity. Explain to the Trainees that they will be asked to plan and implement an activity which meets the objective of evaluating, both verbally and in writing, the overall effectiveness of the training program.

Step 2: **Planning a Training Activity** (45 minutes)

Distribute copies of Handout 32A, "Evaluation Questionnaire". Explain that the questionnaire is provided only as a potential resource in helping to develop a plan for evaluating the program. Assist the Trainees in designing a procedure for evaluating the effectiveness of the program. Mention the importance of outlining the procedures in a step-by-step fashion and of setting time limits based on the time allotted in Step 3.

Step 3: **Implementing the Activity** (2 hours)

Have the Trainees carry out their plan for evaluating the program.

Step 4: **Summary and Conclusion** (30 minutes)

Collect the written evaluations. Conclude the session by soliciting feedback regarding how well the objectives were met. This feedback should focus on the group's effectiveness at evaluating the program as well as on their effectiveness in planning and implementing the activity.

Mention that, after approximately six months in the field as Peace Corps Volunteers, they will be asked to complete a follow-up questionnaire. This questionnaire will be mailed to the Trainees and will solicit feedback regarding how well the training prepared them for their roles as beekeeping Volunteers (see Appendix G).

Trainer Note

○ Use the time remaining to answer any final questions and to take care of any final arrangements relating to the departure of the Trainees.

Appendix A

TRAINING PROGRAM OBJECTIVES

The training program is composed of six general themes. They are: Beekeeping, Cross-Cultural Adaptation, Basic Communication Processes, Volunteer Support and Well-Being, Health and Nutrition and the Role of the Volunteer in Development. These are explained in more detail in the Introduction.

Generally speaking, however, each of these themes serves as the rubric of a complete and interrelated set of specific skills which are considered essential to effective service as a Peace Corps Volunteer. It is difficult to describe any one of these skills in isolation from the others; within the context of Peace Corps service, the skills are interdependent as each skill derives its meaning from the others. To have the technical skills necessary to work with bees means little or nothing without the communication skills necessary to work with beekeepers; nor would technical and communication skills have any value without the skills necessary to cope personally with the stress of cross-cultural adaptation.

The most effective and concise way to define these skills is in the form of specific objectives. These objectives define what the Trainees must do in order to demonstrate that they have succeeded in developing a particular skill or set of skills. The objectives outlined on the following pages describe what are considered to be the minimal requirements for successfully completing the training program. Each Trainee should be able to meet all of the objectives by participating actively in every session of the program.

To demonstrate the basic skills necessary to successfully complete the program the Trainees will:

- Build a KTBH, establish a colony in it and maintain it during the training period.
- Keep appropriate records on the colony's progress.
- Participate in (or see demonstrations of):
    - dividing colonies
    - transferring a rustic colony into a moveable-comb hive
    - hiving a swarm
    - siting hives in an apiary
    - combining colonies
    - transporting hives
    - making starter strips
    - processing beeswax for market
    - preparing beeswax products

- removing, extracting and processing honey for market
- removing old combs
- storing drawn combs
- diagnosing the brood pattern (condition of queen, diseases, pests)
- identifying bee diseases and pests and their control
- adding comb to the broodnest to alleviate a honey bound condition
- controlling swarming
- switching colonies to equalize populations
- rearing queens by simple methods
- preventing and stopping robbing
- feeding bees (including applying drugs)
- protecting bees from insecticides
- providing water for bees
- manipulating colonies for seasonal management
- acquiring protective clothing
- building an extractor
- building a solar wax melter
- building a swarm board
- making bee beards.

○ Prepare extension pamphlets on appropriate methods of queen rearing for small-scale beekeepers.

○ Demonstrate an understanding of the biological and ecological perspective of beekeeping by discussing:

- the three periods of the yearly colony cycle (relating this to seasonal weather variation) and the appropriate management objective for each

- the desirable traits in bees vis-a-vis beekeeping

- the bee space and how it allows for the construction of moveable-comb hives

- the behavioral and ecological adaptations of African and European bees and the effects of African bees on a beekeeping industry based on European bees

- the characteristics of a good bee plant and why a knowledge of the local bee flora is advantageous to the beekeeper

- the multipurpose use of plants and beekeeping.

- Demonstrate an understanding of the factors influencing beekeeping development by examining:
    - the cultural, social and economic milieu of the small-scale farmer/beekeeper
    - the cultural and economic factors which limit beekeeping development
    - the reasons why beekeeping is an appropriate and potentially lucrative activity for many rural families
    - the inputs necessary to mount a beekeeping venture
    - the marketing of hive products
    - the cost analyses of various beekeeping systems and the factors which determine a system appropriate for a particular situation
    - the problems often associated with using "high-technology" beekeeping systems in low-income situations
    - the content and design of feasibility studies for small-scale beekeeping projects.
- Complete a live-in experience of no less than two weeks duration. Success will be measured by trainer visits to the homes and by feedback from the families. Trainees will also:
    - list behaviors experienced which offer cross-cultural comparisons
    - identify, in writing, specific cross-cultural adaptation skills developed as a result of the family live-in
    - identify and list goals which were accomplished
    - write a personal plan for adapting to the new culture as a Peace Corps Volunteer.
- Complete a three-day site visit and successfully plan and implement a community analysis strategy by:
    - practicing appropriate information-gathering techniques
    - listing community needs
    - prioritizing these needs

  - mapping community resources
  - identifying community leaders
  - identifying those needs which can be met in the community without major outside intervention.

- Conduct three method demonstrations which display effective extension and non-formal education techniques for development beekeeping, including:
  - establishing rapport with the audience
  - involving the audience
  - establishing the relevance of the demonstration
  - using appropriate language, visual aids, role plays or other educational techniques
  - demonstrating good organization.

- Demonstrate facilitator skills by:
  - conducting process observations of group interactions
  - exercising task-oriented behavior that maintains group cohesiveness
  - facilitating training sessions.

- Gather information about male and female role patterns in the community surrounding the training site and:
  - list the various behaviors observed among men, women and children
  - identify women's role in the development process and the various factors which influence their degree of participation
  - identify ways to integrate women-in-development issues into beekeeping projects.

- Demonstrate the following communication skills:
  - paraphrasing
  - questioning
  - filtering information
  - checking for understanding

- communicating non-verbally
- giving and receiving feedback
- identifying assumptions
- identifying values.

○ Demonstrate design and evaluation skills, including:

- listing training expectations that have or have not been met
- listing unresolved problems that have occurred in the training program
- helping design a final program evaluation
- conducting on-going evaluations of session design and facilitator skills
- developing criteria for on-going self-assessment
- conducting on-going written and verbal self-assessment activities.

○ Analyze eating habits and the cultural aspects of health and nutrition by:

- identifying nutritious local staple foods in the three food groups
- determining personal food preferences in the three foods groups
- explaining and demonstrating the role of beliefs, values and tradition in determing food consumption practices
- developing an instrument for evaluating the nutritive value of local foods
- listing expected changes in personal diet as a Volunteer
- identifying techniques and strategies for effecting postive changes in the diets of host country nationals
- practicing culturally appropriate ways to cook and consume honey.

- Demonstrate a knowledge of health issues by:
    - listing major diseases and illnesses endemic to the area of assignment
    - listing environmental factors which cause them
    - analyzing the situation of a health problem
    - designing an effective strategy to alleviate a community health problem.
- Identify major symptoms of stress, both positive and negative aspects, and ways to deal with them by:
    - listing behaviors which connote culture shock
    - describing several stress management techniques
    - designing personal stabilizers to counteract stress and culture shock
    - developing personal plans for coping with sexuality and personal relationships in view of host-country values and beliefs.
- Demonstrate an understanding of the role of the Peace Corps Volunteer in the development process by:
    - discussing and describing issues related to a variety of approaches to development work
    - assessing personal styles for working with others
    - determining how those styles may successfully affect long and short term beekeeping projects.
- Apply a culmination of all skills acquired and/or developed during the training program by taking responsibility for all aspects of the planning, promotion, implementation and evaluation of a community-based Bee Fair.

Appendix B

PRE-TRAINING RESEARCH

A pre-training research trip provides the opportunity to tailor a training program to individual country needs. This training program assumes that the trainers are acquainted with the culture in which the Trainees will be working. Familiarity with the culture allows the trainers to:

- encourage realistic expectations among the Trainees
- fine tune the training program to specific cross-cultural and in-country needs
- consider the Trainees' potential adaptability to the culture of their future work situations.

This training program has provided the flexibility necessary for the trainers to respond to the information gathered during the pre-training research trip and the "Bee Management Techniques" sessions can be used to address the training needs for specific Peace Corps' work situations.

To prepare for the pre-training research trip the trainer needs to be thoroughly acquainted with the training philosophy and procedures. Take a copy of the training manual for reference. Familiarizing the Peace Corps staff with the manual will answer many of their questions regarding training design, themes and methods.

The Peace Corps Program Manager who will be working with the beekeeping Volunteers is the most important in-country contact. This individual is the one who will have expectations and desired outcomes of the training program. Also, the Program Manager will be in a position to set up meetings with agency officials with whom the Volunteers will be working, Peace Corps Volunteers in the field and local small-scale beekeepers. Specific information to collect from these individuals is:

- the objectives of the beekeeping project from each perspective
- the definition of the Volunteer's role
- the infra-structure of the host-country sponsoring agency and other aid agencies interested in beekeeping development
- the type of beekeeping activities currently practiced and the nature of indigenous bees
- the availability of beekeeping materials and supplies
- the market for hive products

- the potential for introducing "improved" methods
- the expectations, lifestyles, enjoyments and frustrations with which the Volunteers must contend
- the type of skills deemed necessary to transfer information to the small-scale farmer.

Materials to collect for use by the Trainees should include a map of the country, postcards, recipes and extension pamphlets from the country in which they will be working.

At the end of the stay in a country, develop a "memo-of-understanding" with the Peace Corps staff. This memo should express the mutually understood training needs and the expectations of that specific country.

Appendix C

STAFF AND STAFF TRAINING

A wide range of potential training situations exists within Peace Corps. Each of these calls for a unique staffing pattern; for example, pre-service training programs usually require a larger staff than in-service programs. Also, the staffing patterns for programs done "in-house" by Peace Corps will differ significantly from those of programs done by private contractors. In all cases, however, the following guidelines are important when developing a staffing pattern:

- Trainers should "buy-in" to the use of experiential philosophies as presented in this Manual.
- Trainers should have an integrated concept of the themes of the program.
- There should be a maximum of ten participants per beekeeping trainer.
- There should be a trainer to assume responsibility for delivery of the non-beekeeping sessions (and overall project management, if the setting requires it).
- There should be adequate project support in:
    - administrative/secretarial
    - acquisition of materials and supplies
    - management of training site and housing facilities for both staff and Trainees
    - transportation for field trips, emergencies and daily needs.
- There should be, among the staff, a good balance of skills and experience which can blend well together and complement one another.

In all training programs there are certain key roles and responsibilities which must be undertaken to insure the effective implementation of the program. The number of individuals necessary to carry out these responsibilities will vary in accordance with the length and location of the training and the number of Trainees. Following is a list of staff positions with role descriptions which are essential to all potential training situations:

Director

The primary responsibilities of the Director are to:

- manage all aspects of the project, including logistics coordination (this will vary greatly depending on the training facility used)
- document the program (pre-service training reports, Trainee assessments, in-service training reports)
- with the Technical Trainer, conduct pre-training research, collect appropriate training materials and modify the content and schedule of training to accommodate the local realities
- deliver the non-beekeeping sessions, including selection and acquisition of texts, reference materials and handouts
- participate to the fullest extent possible in the beekeeping training activities to ensure integration of all of the major themes of the program
- coordinate the participation of Peace Corps, host-country agencies and consultants
- implement the selection model (if appropriate)
- become familiar with the contents of this Manual and related Peace Corps materials.

Beekeeping Trainer

The primary responsibilities of this position are to:

- conduct pre-training research, collect appropriate beekeeping information and materials/supplies, modify the content and schedule of training to meet the needs of the specific country
- list and accomplish site preparation tasks for beekeeping
- list and acquire all needed technical materials and supplies, including texts, resources, handouts and other printed materials for the library
- deliver the beekeeping sessions

- prepare progress reports on participants' technical performance
- coordinate and supervise technical trainers/ training assistants
- participate in sessions relating to all themes of the program.

Beekeeping Trainers/ Training Assistants (as needed, depending on group size)

Their primary responsibilities are to:

- deliver designated beekeeping sessions
- provide more individualized training and maximize the experiential learning situation during field work
- assist with in-country set-up and site preparation tasks
- help with logistics during training
- participate in sessions relating to all program themes.

The primary criteria for all staff selection should be:

- good technical skills, either in apiculture or cross-cultural issues
- an understanding of the philosophy and objectives of Peace Corps and Peace Corps training
- committment to the concept of integration of the themes of the program
- strong training skills which are compatible with participatory education programs
- familiarity with experiential learning and its methodologies
- experience as a group facilitator.

Other considerations should be:

- experience in the region or country
- experience with Peace Corps and Peace Corps training
- proficiency in the language used in the training site (unless there is adequate support personnel to assist staff to meet personal and project-related logistical needs).

The overall goal of any staff training activity is to develop a group of individuals into a team that can work well together to deliver the best training program possible. To this end, staff training must provide the opportunity and structure for the following elements:

- team building
- familiarization with the sessions and training materials
- practice in using the sessions, including making modifications resulting from pre-training research reports
- a system for giving and receiving feedback
- an evaluation method.

Staff training might be conducted by any one of a number of different people, depending on the composition of the staff and its relationship to Peace Corps. It might be led by a Peace Corps staff member, an outside consultant or the Director of the training program.

Training activities should be designed to include the following:

- introduction: an ice-breaker that not only formally introduces staff to one another, but also identifies the experience and skills which they bring to the program
- program overview: outline of Peace Corps Volunteers' jobs, their arrival and departure dates, a review of this training Manual and the methodologies to meet Peace Corps expectations
- role clarification: job descriptions as understood by each staff member, discussion of roles, consensus on responsibilities and lines of communication
- team building: exercise to allow staff to begin practicing their roles
- methodologies: review the philosophy and methodologies presented in this Manual, fitting them in with staff members own styles and past training experiences, discuss adult and experiential learning

- facilitation skills: practice facilitating staff training activities and providing feedback on the effectiveness of the skills used

- pre-training research: reports on pre-training research trips and discussion of needs which are to be incorporated into the training program

- pre-program tasks: list the pre-program set-up tasks to be completed, including who will be responsible for each and a time for completion

- revisions: discussion of possible revisions to sessions in order to include country-specific information, re-write of sessions as needed with review and comment by other staff

- resources: review of training materials available to the project, identification of other sources, list of consultants needed and possible institutional resources

- scheduling: devote some time to this on-going process so that the factors determining actual scheduling can be shared and fully understood by all staff

- administration: review the administrative requirements of the program; including reports; logistics of housing, meals and transportation and financial and secretarial support systems

- staff meetings: establish a schedule and purpose for staff meetings

- feedback: if selection of participants is to occur, a selection model must be used and the staff must practice giving feedback to Trainees on how they are progressing toward meeting the selection criteria

- evaluation: revision of the methods which will be used to evaluate the participants' view of training in order to meet the needs of the staff and Peace Corps, and a discussion of the purpose and use of this evaluation information.

On-going staff development exercises will be determined by feedback among staff members and suggestions for improvement from Trainees and staff. Generally, the exercises will deal with the topics of:

- methodology: style of delivery
- scheduling: amount of time allocated for specific topics and projects
- feedback: understanding why it is given and being comfortable with how it is given
- staff: their knowledge of the area of training and their functioning as a cohesive team.

Appendix D

SITE SELECTION AND PRE-TRAINING PREPARATION

SITE SELECTION

The physical environment is an important aspect of any training program. The site for this beekeeping training program should meet all the normal requirements for a Peace Corps training site; and specific to this program, the following considerations are important when choosing a site:

- sufficient land for an apiary
- proximity of the apiary to the classroom and equipment storage area
- remoteness of the apiary from neighbors and others not involved with the training program
- availability of bees and beekeeping equipment in the area
- existence in the area of a level of beekeeping similar to that at which the Trainees will be working
- facilities and beekeeping situations for field trips
- sufficient families in the area to house the Trainees during the live-in.

PRE-TRAINING PREPARATION

Many tasks need to be completed before the Trainees arrive. These include ordering needed books and materials, setting up the classroom, office and reference library and making arrangements for the family live-in, the site visit and field trips.

The bibliography lists the printed materials needed for the training program. Note those which are to serve as texts and be sure to order a copy for each Trainee.

Materials which will be needed early in the program should be on hand at the start of training. The observation hives which will be used in Session 1, "Establishing Observations Hives and Group Resource Assessment", should be ready to be set up. Gather the materials needed for Session 5, "Assembling Protective Clothing". The veil or screening material is often difficult to find and may have to be ordered from a beekeeping equipment supplier. In some areas where the bees are highly defensive, consider ordering bee-proof suits for each of the Trainees. The materials needed for Session 6, "Constructing KTBH's and Preparing the Apiary Site", need to be ordered so that they will be available for the first week of training. Purchase adrenalin and syringes or a sting kit to have available throughout the training. A list of materials needed for the training program is given at then end of this section.

Bees are an important pre-training consideration. Queen cells need to be started such that they are available for Session 1, "Establishing Observation Hives and Group Resource Assessment", and Session 10, "Establishing Individual Nucs". As these sessions occur at different times, start two groups of cells and schedule the queen rearing such that the adult queens emerge one or two days after the sessions.

There should be sufficient bees available for each of the Trainees to establish a nuc of moderate size in their KTBH's. In some training situations, there should also be a Langstroth hive available for each Trainee. Besides the bees needed for the Trainees' individual hives, colonies will be needed for Session 24, "Queen Rearing" and Session 28, "Constructing a Swarm Board and Swarms".

Arrangements for the family live-in need to be made. Select families based on the physical facilities of the housing and on the cross-cultural sensitivity of the family members. The family should be willing to accept Trainees as members of the family instead of treating them as visitors or boarders. Identify members of the training staff to serve as orientators. The orientators act as a liaison between the family, the Trainee and the training staff; thus, the orientator should speak the local language and be familiar with both the local culture and the culture of the United States. (See Session 2, "Introduction to Family Live-In".)

Become familiar with beekeepers in the area before the Trainees arrive. Local beekeepers are valuable contacts for setting up field trips.

Determining sites for the Trainee site visit is another task to accomplish. Guidelines for choosing the sites are in Session 34, "Preparation for Site Visit - Information Gathering".

LIST OF MATERIALS

bees
KTBH
Langstroth Hive
observation hives
queen cages

veil material
string
elastic banding
hats
veils
gloves
smokers
hive tools
insect net
kill jar
package for shipping bees
queen excluder
pollen traps
water sprayer

beeswax
honey
comb foundation
preserved samples of bees
    (African & European)

sting kit
tetracycline
sulfur
alcohol

watch

slides of:
    various beekeeping situations
    various hive types
slides or pictures of:
    honey bee diseases

newsprint
paper
chalk
world map
markers
pens
scissors
pencils
notebooks
blackboard
crayons
construction paper

hand lens
ingredients for beeswax
    products

tape measure
saws
paint brushes
nails
wire/rope
paint
concrete blocks
pocket knife
fast drying paint
muslin cloth
hammers
wood chisel
wood
thin sheet metal
plane
wood posts
jars with lids
wire screening
hardware cloth (5 holes
    per 2.54 cm)
glue
sandpaper
straight pins
machete
tin snips
flannel
buckets
large pots
cooking & eating utensils

Appendix E

MANAGEMENT AND ADMINISTRATIVE GUIDELINES

Managing and Administrating a training program is a complex task which involves a delicate balance between complying with contractual obligations and attending to the needs of all participants. The goal of effective administration is to assure the smooth implementation of the training design within an open, flexible environment which promotes creativity and maximum participation on the part of all Trainees, trainers and support staff.

Management and administration are traditionally defined as being the reponsibility of the Project Director (see staff job descriptions in Appendix C). However, within the context of a participatory program design, everyone should be encouraged to be involved in all aspects of the program, including managers and administrators. This promotes high motivation and a dedication to quality on the part of the staff. It also provides Trainees with a model for an effective management technique which is consistent with the Peace Corps' approach to development work.

The following list is a brief description of some of the most important administrative tasks and guidelines associated with the effective implementation of this program:

- Meet with the APCD in-country or the Stateside Project Manager regarding training design and content. Contact and develop work relationships with appropriate Peace Corps, local community and Ministry officials.

- Establish budget and procurement guidelines and accounting procedures. Orient and train a secretary/bookkeeper. Establish credit and accounts in the training community for services necessary to training, such as:
    - banking
    - fuel supplies
    - mechanics
    - office supplies
    - technical materials.

- Assemble, introduce and orient the staff to the site, the contract, the training manual and Peace Corps' policy. Set up and monitor the staff training design (see Appendix C). Facilitate such components of the staff training as defining roles and reponsibilities and establishing the overall policies, goals and approaches of the program. Define the entire set-up process as a staff training exercise by identifying the necessary tasks, delegating responsibilities and establishing a time line for task completion.

- Decide with the staff how to set up the office facilities, classrooms, storage areas, library and all necessary work areas.

- Establish adequate transportation facilities and systems to include transporting Trainees, staff and supplies.

- Set up communication and information systems, including:
    - telephone
    - radio
    - messenger services
    - bulletin boards
    - mailboxes
    - filing systems
    - inter-staff messages
    - on-going staff meeting schedule.

- Establish the appropriate medical facilities. Be sure to verify the availability of local medical care, hire and orient a medical consultant, and, procure the biologicals for required immunizations. Also, establish links with the in-country Peace Corps medical office.

- Work with trainers and staff to develop their objectives, session lists, supply lists, budgets and handout materials. Monitor the orientation and training of training assistants and/or local consultants.

- Set up Trainee living, dining and recreation accommodations. Carefully assure that all aspects of the family live-in are well planned and executed (see Appendix D).

- Develop administrative training sessions and objectives, including all activities related to Trainee orientation, Trainee assessment and program evaluation.

- Notify the appropriate Peace Corps representatives upon the arrival of the Trainees. Throughout the program, monitor the contract carefully and keep Peace Corps informed concerning all aspects of the evolution of the program. Submit regularly scheduled reports.

- Establish and orchestrate a system of on-going staff training and development. Encourage staff members to conscientiously refine their training skills by giving one another feedback, conducting effective staff meetings and working together to solve their problems and make decisions.

- Continue to facilitate the smooth implementation of all aspects of the program, during the training, by planning ahead, anticipating problems or bottlenecks and taking steps to prevent them. Be sure to have cash available for the Trainees during those sessions in which they purchase materials.
- Conduct a departure planning meeting with trainers and staff in the fifth week of the program. Plan all aspects of Trainee departure and closing down the training facilities.

Appendix F

GUIDELINES FOR ALTERNATIVE PROGRAM DESIGNS

The following are suggested formats and design alterations necessary for converting the six-week program described in this manual into a twelve-week pre-service program and two in-service programs. In designing an alternative program, trainers should review the entire manual carefully and choose sessions which meet country-specific needs. Also, wherever necessary, individual procedures within sesions should be modified to account for the specific goals and objectives of the program being designed. The formats and designs provided in this Appendix are meant to serve only as guidelines for the development of creative designs relative to the specific needs of each situation.

Important considerations when developing alternative program designs are:

- Trainees should start working with bees the first day of the program. When they arrive at training, they will be anxious to start experiencing bees and beekeeping instead of hearing about them.
- Trainees should establish their individual nucs as soon as possible after the program starts. If they start their colonies with ripe queen cells, it will take about ten days for the colony to have a laying queen and about thirty-one days for the first new brood to emerge in the colony. By starting the nucs early in the training program, Trainees will be able to observe a wide range of activities in their colonies.
- The integrated nature of the training program should be preserved. The synergistic effect of integrating the themes of the program is valuable. Such integration results in Trainees who are better prepared to meet the challenges of their Peace Corps experience.
- Field trips should be preserved in any pre-service training. These are valuable in helping the Trainees to establish realistic expectations of their future roles as Peace Corps Volunteers.
- The sequencing and scheduling of sessions on constructing, queen rearing and other bee management operations should be maintained. This will give the Trainees adequate time to experiment and to redesign their projects if necessary.
- Flexibility should be provided throughout the program schedule. Unpredictability is an aspect of both beekeeping and training.

TWELVE-WEEK SCHEDULE WITH LANGUAGE TRAINING

A language component in a training program greatly broadens the possibilities for integration. Language ability enables the Trainees to move out more into the community. Trainees are better equipped to put into practice their new skills if they are learning the local language. A twelve-week program also gives the Trainees more time to observe their nucleus grow into a colony.

This is a suggested format for a twelve-week schedule which includes 231 hours of language training. An actual schedule will vary depending upon the specific training situation. Some sessions in this manual may need to be modified to accomodate the twelve-week schedule.

TWELVE-WEEK SCHEDULE

WEEK ONE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 1: Establishing Observation Hives - Group Resource Assesment (3 hrs., 30 min.) SESSION 2: Introduction to Family Live-in (3 hrs., 30 min., includes lunch)	Language (4 hrs.)	SESSION 5: (con't) Assembling Protective Clothing (5 hrs.)	Language (4 hrs.)	Language (6 hrs.)	SESSION 12: Introduction to Assessment and Selection (2 hrs., 30 min.) SESSION 13: Introduction to Program Evaluation (1 hr., 30 min.)
SESSION 3: Training Site Investigation (2 hrs.) SESSION 1: (con't) Siting the Observation Hives (1 hr.)	SESSION 4: Defining Expectations (3 hrs.) SESSION 5: Assembling Protective Clothing (1 hr.)	Language (3 hrs.)	SESSION 6: Constructing KTBH's and Preparing the Apiary Site (4 hrs.)	SESSION 6: (con't) Constructing KTBH's and Preparing the Apiary Site (2 hrs.)	

WEEK TWO

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	SESSION 6: (con't) Constructing KTBH's and Preparing the Apiary Site (4 hrs.)	Language (2 hrs.) SESSION 9: Communication and Listening Skills (2 hrs.)	Language (2 hrs.) SESSION 10: Establishing Individual Mucs (4 hrs.)	Language (4 hrs.)	Language (4 hrs.)
SESSION 8: Adult Learning and An Introduction to Method Demonstrations - Basic Insect Anatomy (4 hrs.)	Language (4 hrs.)	Language (2 hrs.) SESSION 7: Bee Colony Cycle - Introduction to Trainee Facilitation (2 hrs.)	SESSION 11: Functional Biology of the Honey Bee (2 hrs.)	SESSION 14: Bee Management Techniques (4 hrs.)	

TWELVE-WEEK SCHEDULE

WEEK THREE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	SESSION 17: Foraging (2 hrs.) SESSION 18: Hive Design Criteria and Swarm Boxes (2 hrs.)	Language (4 hrs.)	Language (4 hrs.)	Language (4 hrs.)	SESSION 23: Family Live-in Analysis (2 hrs.) SESSION 12: (con't) Assessment and Selection I (2 hrs.)
SESSION 15: Basic Nutrition (2 hrs.) SESSION 16: Types of Bees and the Bee-Human Relationship (2 hrs.)	Language (4 hrs.)	SESSION 8: (con't) Method Demonstrations I (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	SESSION 19: Role of the Volunteer in Development (4 hrs.)	

WEEK FOUR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	SESSION 22: Transferring Colonies (8 hrs.)	Language (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (2 hrs.) SESSION 25: Health and Hygiene (2 hrs.)	Language (4 hrs.)	Language (4 hrs.)
SESSION 14: (con't) Bee Management Techniques (4 hrs.)		SESSION 20: The Bee Space and Types of Hives (2 hrs.) SESSION 21: Obtaining Bees (2 hrs.)	Language (4 hrs.)	SESSION 31: Women in Development - The Role of Men and Women (4 hrs.)	

TWELVE-WEEK SCHEDULE

WEEK FIVE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 24: Queen Rearing (4 hrs.)	Language (4 hrs.)	SESSION 29: Visual Aids - Queen Rearing Preparation (4 hrs.)	Language (4 hrs.)	SESSION 14: (con't) Queen Rearing (4 hrs.)	SESSION 30: (con't) Extractors and Solar Wax Melters (4 hrs.)
Language (4 hrs.)	SESSION 24: (con't) Queen Rearing (2 hrs.) SESSION 26: Swarming, Supersedure and Absconding (2 hrs.)	Language (4 hrs.)	SESSION 30: Extractors and Solar Wax Melters (2 hrs.) SESSION 14: (con't) Bee Management Techniques (2 hrs.)	Language (2 hrs.) SESSION 28: Constructing a Swarm Board and Swarms (2 hrs.)	

WEEK SIX

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	SESSION 30: (con't) Extractors and Solar Wax Melters (8 hrs.)	Language (4 hrs.)	Language (4 hrs.)	Language (4 hrs.)	SESSION 32: Mid-Program Evaluation (4 hrs.)
SESSION 28: (con't) Constructing a Swarm Board and Swarms (4 hrs.)		SESSION 14: (con't) Bee Management Techniques (2 hrs.) SESSION 27: Culture Shock (2 hrs.)	Language (2 hrs.) SESSION 12: (con't) Assessment and Selection II (2 hrs.)	SESSION 8: (con't) Method Demonstrations II (4 hrs.)	

TWELVE-WEEK SCHEDULE

WEEK SEVEN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	Language (4 hrs.)	VISIT	VISIT	VISIT
Language (2 hrs.) SESSION 14: (con't) Bee Management Techniques (2 hrs.)	Language (4 hrs.)	SESSION 34: Preparation for Site Visit - Information Gathering (4 hrs.)	SITE	SITE	SITE

WEEK EIGHT

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SESSION 35: Site Visit - Follow-up and Conclusions (4 hrs.)	Language (4 hrs.)	Language (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	Language (4 hrs.)	Language (4 hrs.)
Language (4 hrs.)	SESSION 33: Melliferous Plants (2 hrs.) SESSION 30: (con't) Extractors and Solar Wax Melters (2 hrs.)	SESSION 30: (con't) Extractors and Solar Wax Melters (4 hrs.)	Language (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	

TWELVE-WEEK SCHEDULE

WEEK NINE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	SESSION 38: Anaphylactic Shock (2 hrs.) Language (2 hrs.)	Language (4 hrs.)	SESSION 40: Beeswax Field Trip (4 hrs.)	Language (4 hrs.)	Language (2 hrs.) SESSION 12: (con't) Assessment and Selection III (2 hrs.)
SESSION 14: (con't) Bee Management Techniques (4 hrs.)	Language (2 hrs.) SESSION 36: Honey (2 hrs.)	Language (2 hrs.) SESSION 46: Bee Diseases and Pests (2 hrs.)	SESSION 41: Bees and Trees (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	

WEEK TEN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	SESSION 37: Other Hive Products (2 hrs.) Language (2 hrs.)	SESSION 47: Insecticides and Bees (2 hrs.) Language (2 hrs.)	Language (4 hrs.)	Language (4 hrs.)	SESSION 30: (con't) Bee Fair Preparation (4 hrs.)
SESSION 43: Creamed Honey and Beeswax Products (4 hrs.)	SESSION 42: Project Planning and Development (4 hrs.)	Language (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (4 hrs.)	Language (2 hrs.) SESSION 39: Introduction to the Bee Fair (2 hrs.)	

TWELVE-WEEK SCHEDULE

WEEK ELEVEN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	Language (2 hrs.) SESSION 48: Cooking with Honey (5 hrs. including lunch)	Language (4 hrs.)	Language (4 hrs.)	Language (4 hrs.)	SESSION 49: Introducing Innovation-Expectations Beyond Training (2 hrs.) SESSION 50: Future Training Needs (2 hrs.)
SESSION 14: (con't) Bee Management Techniques (4 hrs.)	SESSION 14: (con't) Bee Management Techniques (3 hrs.)	Language (2 hrs.) SESSION 14: (con't) Bee Management Techniques (2 hrs.)	SESSION 39: (con't) Bee Fair Preparation (4 hrs.)	SESSION 44: Introduction to Final Assessment (1 hr.) SESSION 45: Cost Analysis and Project Evaluation (3 hrs.)	

WEEK TWELVE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Language (4 hrs.)	Language (4 hrs.)	SESSION: 39 (con't) The Bee Fair (4-6 hrs.)	Language FSI Examination (8 hrs.)	SESSION 51: Site Restitution SESSION 12: (con't) Final Assessment and Selection (Concurrently with Session 51)	SESSION 52: Final Program Evaluation (4 hrs.)
SESSION 39: (con't) Bee Fair Preparation (4 hrs.)	SESSION 39: (con't) Bee Fair Preparation (4 hrs.)	SESSION 39: (con't) Bee Fair Evaluation (2 hrs.)			

IN-SERVICE TRAINING FOR BEGINNING BEEKEEPERS

The in-service needs of a Volunteer are markedly different from those of a pre-service Trainee. The Volunteer is responding to a more immediately felt need; hence, there is often more of an eagerness to learn. Volunteers have also learned from field experience what and how much they need to know. Because of their field experience, they are better able to filter information to suit their own needs. The design of this training is based on these factors.

This in-service training (IST) is intended to provide an orientation to the basics of beekeeping. The emphasis is on presenting as many different beekeeping techniques as can be effectively assimilated in a one-week period. The aim of the program is to give as much "hands-on", practical experience as possible. This is important for beginning beekeepers so that they can gain confidence in themselves and become comfortable working with bees. As much as possible, the apiary should be the classroom.

The following schedule represents a proposed design for this in-service training. Each of the sessions indicated is based directly upon the design and objectives of one or more of the sessions in the six-week program. Essential and necessary modifications of the procedural designs indicated in the six-week program are described where appropriate for certain sessions.

IN-SERVICE TRAINING FOR BEGINNING BEEKEEPERS

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Establishing Observation Hive - Group Resource Assessment (2 hrs., 30 min.) Defining Expectations (1 hr., 30 min.)	Protective Clothing (30 min.) Bee Colony Cycle (1 hr.) Bee Management Techniques (2 hrs. 30 min.)	Types of Bees, The Bee Space and Types of Hives (2 hrs.) Bee Management Techniques (2 hrs.)	Swarming, Supersedure and Absconding (2 hrs.) Constructing a Swarm Board and Swarms (2 hrs.)	Bee Diseases and Pests and Insecticides (2 hrs.) Bee Management Techniques (2 hrs.)	Project Planning (2 hrs.) Program Evaluation (2 hrs.)
Bee Management Techniques (4 hrs.) Siting the Observation Hive (1 hr.)	Functional Biology of the Honey Bee (2 hrs.) Bee Management Techniques (2 hrs.)	Bee Management Techniques (4 hrs.)	Melliferous Plants (2 hrs.) Bee Management Techniques (2 hrs.)	Honey and Other Hive Products (2 hrs.) Bee Management Techniques (2 hrs.)	

SUGGESTED RESOURCES AND MODIFICATIONS FOR IN-SERVICE TRAINING FOR BEGINNING BEEKEEPERS

SESSION	TOTAL TIME	SESSION RESOURCES FROM SIX-WEEK PROGRAM	STEPS TO INCLUDE &/OR EMPHASIZE	STEPS TO OMIT	COMMENTS
Establishing Observation Hive - Group Resource Assessment	2 hours, 30 min.	1	all	-----	Reduce the time allotted to Steps 1, 3 and 6 so that the session fits the schedule.
Defining Expectations	1 hour, 30 min.	4	2 and 3	1	Eliminate the use of the "program objectives" and the "manual introduction". Focus primarily on the "training schedule". Reduce the time allotted to Steps 2 and 3, such that the entire activity can be conducted in 1 hour, 30 min.
Bee Management Techniques	21 hours	6, 10, 14 22, 24, 3[illegible] 48	-------	-----	The content will vary depending upon the training situation and facilities available. Vary the time and content of the resource sessions to meet the needs of the training group.
Protective Clothing	30 minutes	5	1	2-5	----------------
Bee Colony Cycle	1 hour	7	1-3	4-7	----------------
Functional Biology of the Honey Bee	2 hours	11	1-4	5	Add 15 minutes to Step 4.

Types of Bees, The Bee Space and Types of Hives	2 hours	16	2,4	1,3,5	If Step 3 is relevant to the training situation, use "Bee Management Techniques" time to cover the topic.
		20	1,2,4	3,5	Use Attachment 20A as a Handout for Step 2.
Swarming, Supersedure and Absconding	2 hours	26	1-4	5	Increase the time for steps 1-3 by 5 minutes each.
Constructing A Swarm Board and Swarms	2 hours	28	3,4,8	1,2,5 6,7,9	Construct the swarm board before the session. Eliminate setting up swarm boxes in Step 3 and reduce the time to 55 minutes. If anyone is interested in making a bee beard, do this during a "Bee Management Techniques" session.
Melliferous Plants	2 hours	33	1,2	3	Add 15 minutes to Step 2.
Bee Diseases and Pests and Insecticides	2 hours	46	1,2,3	4	In Step 1, present the disease differentiation chart instead of having the Trainees develop it; thus, use 1 hour to conduct Steps 1 and 2.
		47	1,2,3,4	5	Use Step 1 as a 5 minute introduction to the topic. Reduce the time to conduct Steps 2-4 such that they take 40 minutes.

Honey and Other Hive Products	2 hours	36	1-6	7	Reduce the time allotted to Step 3 to 10 minutes.
		37	1	2,3	Reduce the time allotted to Step 1 to 30 minutes and emphasize those products common in the area.
Project Planning	2 hours	42	2,3,5,7	1,4,6	Reduce the time of Step 3 to 30 minutes and have the entire group work together to plan the feasibility study.
Program Evaluation	2 hours	32	2,3	1	Reduce the time allotted for Steps 2 and 3 by 15 minutes each. Exercise "Option B" for Step 3.

FOLLOW-UP TRAINING FOR SKILL-TRAINED BEEKEEPERS

The in-service training needs of a group of experienced beekeepers are unique. Volunteers who have sucessfully completed a beekeeping training will have already covered all of the basic beekeeping skills. Once these skills are covered, Volunteers only become beekeepers by practicing them. Becoming a beekeeper is an on-going process. Therefore, an aim of this program is to reinforce those skills already learned and to instill confidence in the Volunteers that they are progressing in their beekeeping knowledge and expertise.

After beekeeping experience in the field, Volunteers will be better able to determine their advanced-skill needs and guide the training program accordingly. The first priority of the program, therefore, is a stage-setting session to assess the resources of the group, to determine their training needs and to develop a strategy for addressing them.

Queen rearing is an advanced beekeeping technique. It entails many subtleties of bee management and provides a good exercise for honing beekeeping skills. Queen rearing is a basic focus of the bee management techniques in this in-service training design. It provides the context for addressing other topics such as disease and pest problems specific to the situations in which the Volunteers are working.

Another feature of the design of this follow-up training is a discussion of the factors involved in setting up a honey bee stock selection and maintenance program. This provides a theoretical framework for bringing together the beekeeping observations and skills of the participants.

While the need for actual "hands-on" experience in beekeeping management techniques is somewhat limited in this follow-up training, the need for problem-solving, extension and communication skills is recognized as being of importance. The focus of the week is the design and development of a workshop by the Volunteers, specific to their work in the field. This focus can be especially enhanced if Peace Corps Volunteers' colleagues from the host country can be invited to participate in the program.

The following schedule represents a proposed design for this in-service training. Each of the sessions indicated is based upon the design and objectives of one or more of the sessions in the six-week program. Essential modifications of the procedural designs are described where appropriate for certain sessions. Both time and content of the sessions need to be adjusted to meet the constraints of a one-week workshop.

FOLLOW-UP TRAINING FOR SKILL-TRAINED BEEKEEPERS

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Group Resource Assessment (2 hrs.) Defining Expectations (2 hrs.)	Extension Skills: Recognizing Needs (2 hrs.) Extension Skills: Designing a Presentation (2 hrs.)	Bee Disease and Pest Problems (2 hrs.) Setting Up a Honey Bee Stock Selection Program (2 hrs.)	Bee Management Techniques and Queen Rearing (2 hrs.) Extension Skills: Preparing Materials (2 hrs.)	Extension Skills: Presenting Materials (4 hrs.)	Extension Skills: Presenting Materials (2 hrs.) Program Evaluation (2 hrs.)
Bee Management Techniques and Queen Rearing (4 hrs.)	Bee Management Techniques and Queen Rearing (2 hrs.) Extension Skills: Preparing Materials (2 hrs.)	Extension Skills: Preparing Materials (4 hrs.)	Preparing Proposals for Bee Projects (4 hrs.)	Bee Management Techniques and Queen Rearing (4 hrs.)	

SUGGESTED RESOURCES AND MODIFICATIONS FOR FOLLOW-UP TRAINING FOR SKILL-TRAINED BEEKEEPERS

SESSION	TOTAL TIME	SESSION RESOURCES FROM SIX-WEEK PROGRAM	STEPS TO INCLUDE &/OR EMPHASIZE	STEPS TO OMIT	COMMENTS
Group Resource Assessment	2 hours	1	1,4,5,6,7	2,3,8	Focus on ice-breaking and resource assessment activities.
Defining Expectations	2 hours	4	2,3	1	Do not use the "program objectives" or the "manual introduction". Focus on discussing and negotiating the program schedule to best address the needs of the Volunteers.
Bee Management Techniques and Queen Rearing	12 hours	14, 21, 22 24, 26, 28 33, 43, 48	-----	-----	The nature of these sessions will be determined during the "Group Resource Assessment" and "Defining Expectations" periods. Topics and techniques should meet the needs of the participants and the situation.
Extension Skills	18 hours	8, 9, 19, 29	-----	-----	This is also dependent upon the needs of the participants and the situation. The participants should determine their extension needs, design a presentation, prepare materials and present them. The materials generated may take many forms but they should all be directly applicable to the participants field situation.
Bee Disease and Pest Problems	2 hours	46	1,2,3	----	Emphasize those problems which are specific to the situation.

Setting Up A Honey Bee Stock Selection Program	2 hours	21, 24	-----	-----	The content of this session will vary greatly depending on the situation. An in-depth discussion of this is only necessary where queen rearing is common among beekeepers.
Preparing Proposals For Bee Projects	4 hours	42	2,3,5,7	1,4,6	Have the group work only on planning the feasibility study in Step 3 and reduce the time by [illegible] minutes.
		45	3,4,	1,2	
Program Evaluation	2 hours	32	2,3 (Option B)	1	Reduce the time for Steps 2 and 3 by 15 minutes.

NOTE: These are suggested resources. Supplement these with material which is specific to the training situation.

Appendix G

FOLLOW-UP QUESTIONNAIRE

After six months of field experience, program participants will be able to provide valuable feedback regarding the effectiveness of the training program in meeting their needs as Volunteers. The questionnaire is provided as a tool to conduct a six-month follow-up evaluation of the program.

Send a copy of the questionnaire to each of the program participants six months after they swear in as Peace Corps Volunteers. Share the results of the questionnaire with both the in-country program manager and with the Peace Corps Office of Program Development in Washington, D.C.

The results of the questionnaire should serve as the basis for modifying and improving future beekeeping pre-service and/or in-service training programs.

NAME: ______________________________ DATE ________

LOCATION OF TRAINING: ______________________________

DATES OF TRAINING: ______________________________

TYPE OF TRAINING (PRE-SERVICE OR IN-SERVICE TRAINING):

____

CURRENT COUNTRY ASSIGNMENT: ______________________________

CURRENT ASSOCIATED AGENCY: ______________________________

This questionnaire will provide us with information which will be useful to increase the effectiveness of future beekeeping training programs. We would appreciate your thoughtful consideration in making specific comments on your feelings about your training. Use additional paper if necessary. Thank you.

1. Development of Technical Competence:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

____

____

____

2. Development of Cross-Cultural Awareness and Sensitivity:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

____

____

____

3. Development of Extension and Technology Transfer Skills:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

4. Preparation for Your Future as a Peace Corps Volunteer:

Not Successful		Moderately Successful		Very Successful
1	2	3	4	5

Comments:

5. List and explain those aspects (such as content, an insight, an interaction, a process or something shared) of the beekeeping program which you consider to have been valuable.

6. Now that you are a Peace Corps Volunteer, what do you wish had been included or emphasized more during the beekeeping training?

____

____

____

____

____

7. What do you wish had been emphasized less during the training?

____

____

____

8. What skills or topics would be most important to emphasize in an In-Service Training program? Could these have been addressed effectively during your beekeeping training?

____

____

____

____

____

9. How long was your beekeeping training? ____________ Was this time too long or too short to adequately prepare you for your Peace Corps work?

____

____

____

10. Do you feel that Trainees facilitating sessions was a good idea? ________________ Why? or why not?

11. Which three sessions do you feel best prepared you for your Peace Corps Volunteer life/work? Please add comments.

12. Which three sessions do you remember which you found boring, worthless or not worth the effort? Please add comments.

13. Have you yet or do you plan to build any of the equipment built during training (e.g., solar wax melter, dip board, honey extractor, KTBH)?

14. Have you been involved with either successful or unsuccessful queen rearing?

____

15. Have you been able to correctly identify the bee diseases and pests which you have encountered in your work?

____

16. Have you been presenting beekeeping talks to groups? Have you used visual aids? ______________________ If so, how have the groups reacted to you, your presentation and visual aids?

____

____

____

____

17. To date, what kind of beekeeping work have you been involved with and how did you make or establish contact with the local beekeepers?

____

____

____

____

____

18. Are women interested, investigating or participating in any of your beekeeping activities?

____

19. How do you think you could involve more women with beekeeping?

____

____

____

20. Do you use an observation hive in your beekeeping development or extension work?

____

Appendix H

BIBLIOGRAPHY

Key

○○○ Indicates publications which should be ordered in sufficient quantities for distribution to all Trainees.

○○ Indicates publications which should be on hand as reference materials and/or for photocopying of selected parts for distribution to Trainees.

○ Indicates publications which are recommended as reference materials but not vital to conducting the program.

[IBRA] Indicates publications available from:

International Bee Research Association
Hill House
Gerrards Cross
Bucks, SL9 ONR
England

[ICE] Indicates publications available from:

Peace Corps
Information and Collection Exchange
806 Connecticut Ave., N.W.
Washington, D. C. 20526

[SOD] Indicates publications available from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D. C. 20402

[ ] Indicates that the publication is available from the address given.

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RESOURCES

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Appendix I

BEEKEEPING: A PRESENTATION PACKAGE

The focus of the beekeeping training program is on equipping future Peace Corps Volunteers with the skills necessary to live in another culture and to promote appropriate beekeeping development. This is a creative process that requires individuals to take an active role in identifying their own needs and finding appropriate and sustainable ways to meet them.

The training creates a model of the process of development by encouraging Trainees to become actively involved in the design and implementation of their program. Trainees are urged to cooperate with others and identify and use the talents and resources available within the group. They practice skills that help to motivate others toward self-reliance. The emphasis placed on developing and reinforcing these skills reflects Peace Corps' belief that beekeeping expertise is valuable only when it is balanced with other qualities.

The approach to training is based on the principles of non-formal education and is designed to strike a balance between structured learning and independent discovery; Trainees develop a working knowledge of beekeeping, as well as skills for applying that knowledge in a meaningful way.

The program themes include:

- Beekeeping
- Cross-Cultural Adaptation
- Basic Communication Processes
- Volunteer Personal Support
- Health and Nutrition
- The Role of the Volunteer in Development

BEEKEEPING TRAINING

This beekeeping training program is designed to give Trainees an appreciation of the biological, cultural and economic factors affecting honey bee management. Emphases are on sub-tropical and tropical beekeeping and on appropriate beekeeping technologies. The aim is to make the Trainees into effective beekeeping development Volunteers.

The objectives of this training in beekeeping are based on the Trainees having their own colonies of bees to take care of during the training period as well as:

participating in (or seeing demonstrations of):

- living with a family in the community
- extracting and processing honey for market
- processing of beeswax for market and preparing beeswax products
- preparing and presenting method demonstrations
- rearing queens
- dividing colonies
- feeding bees (including applying drugs)
- hiving a swarm
- transferring a rustic colony into a moveable-comb hive
- storing drawn combs
- building and working with a Kenya Top Bar Hive, an intermediate technology hive
- identifying bee diseases and pests and their control
- visiting a rural community and conducting a needs assessment
- manipulating colonies for seasonal management
- constructing appropriate beekeeping equipment in small groups
- evaluating the training program
- assessing their own progress in training
- planning, organizing and conducting a Bee Fair for the community.

acquiring an understanding of:

- the bee space and how it allows for the construction of moveable-comb hives
- the three periods of the yearly colony cycle (relating this to the seasonal weather variation) and the appropriate management objective for each
- the desirable traits in bees vis-a-vis beekeeping
- the appropriateness and money earning potential of beekeeping for many rural families
- the cultural and economic factors which limit beekeeping development
- the inputs necessary to mount a beekeeping venture
- the guidelines for project planning and evaluation
- the characteristics of a good bee plant and why a knowledge of the local bee flora is advantageous to the beekeeping
- the prevailing health, nutrition and sanitation conditions
- the importance of staying healthy and meeting nutritional and personal needs in the new culture
- the cultural, social and economic milieu of the small-scale farmer/beekeeping with whom they will be working
- the role of women in the development process
- the effective use of extension skills and techniques to teach about beekeeping.

THE ROLE OF THE BEEKEEPER VOLUNTEER

Beekeeping Peace Corps Volunteers can be very effective as extension agents. In many countries, there is an almost total lack of specific extension effort in beekeeping which is aimed towards small-scale farmers. This is a gap that Peace Corps has responded to well. Peace Corps beekeeping programs have been very successful on a number of occasions and they have provided many individuals with meaningful Volunteer experiences.

The duties of a beekeeper vary somewhat depending on if the Volunteer is setting up a new program or working in an already existing beekeeping venture. Depending on the situation, the job could include the reponsibilities to:

- Establish an apiary (or use the existing apiary) to determine:
    - the nature of the beekeeping cycle so that appropriate management strategies can be applied
    - the production potential of hive products
    - the economic practicalities of beekeeping in the area.
- Determine and introduce a level of beekeeping technology that can be sustained with locally available resources.
- Work with agency personnel and local farmers to improve their beekeeping and honey harvesting practices.
- Assist other Volunteers involved in beekeeping as a secondary activity.

A task analysis of the duties of a Volunteer beekeeper would include:

- Making hives (or finding carpenters to make hives).
- Procuring a smoker, veils, gloves and protective clothing. All of these things can be made locally; though for a beginning project it may be best if Volunteers take these with them. This would save a lot of time and frustration in the early stages. Also, the equipment could serve as prototypes for local workers.
- Getting bees from an established apiary, rustic hives or wild colonies from the bush.
- Checking the size of the brood nest and the incoming resources to the hive to monitor colony development to seasonal variations.
- Determining the potential production of a colony in the area so that a realistic cost/benefit ratio can be determined for lower level technology beekeeping ventures in the area.
- Assessing the local availability of lumber, ability of carpenters and availability of other materials to build intermediate-technology hives.
- Assessing the economic resources and technical level of local farmers to determine an appropriate level of beekeeping technology for the area.
- Conducting extension visits/workshops with local farmers and fellow agency workers.
- Visiting other Volunteer beekeeping projects.
- Conducting in-service workshops for other Volunteers.
- Conducting pre-service training component in beekeping for Trainees.

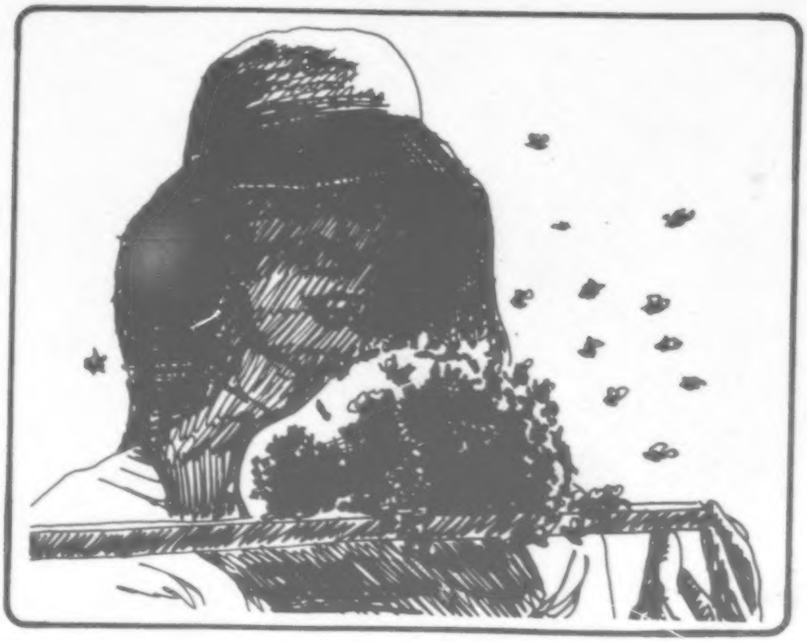
Many planners of beekeeping ventures put an emphasis on the study of the bee flora that exists in the project area. This is a waste of resources in a beginning project and is often an unrealistic expectation for a Volunteer. It is far more practical to accept that a bee resource exists if the bees are making honey. The identification of bee flora is an integral part of the beekeepers' knowledge that is acquired with experience. A special study is not needed. It will be learned when there are beekeepers to observe it.

The most practical and effective goal for Peace Corps involvement in beekeeping is to introduce improved methods. A selection and breeding program to improve bee stock is somewhat beyond the scope of Peace Corps particiption in bee development programs. A well-developed beekeeping industry predicates these activities. To be successful, they need support and commitment beyond that which most Peace Corps programs can provide.

For most Volunteer beekeeping extension positions, the level of expertise is sufficient to prepare them for their jobs. However, there are possibilities in some countries for programming beekeepers at high ministry levels where only a person with previous beekeeping experience could successfully operate if both the Volunteer and Peace Corps are to have credibility with the host institutions.

Unlike some other agricultural undertakings, the question of Peace Corps involvement in beekeeping is not one of biologicial feasibility. Rather, it is a queston of the institutitonal and programming feasibility of the country. The question is determining how best to use Volunteer resources to introduce new methods of honey bee husbandry.

The potential for beekeeping development is great. The potential for Peace Corps involvement in beekeeping development is also great. The challenge for you as a Peace Corps decision-maker is to make this potential a reality.



BEEKEEPING: A SLIDE PRESENTATION

This is a brief illustration of how some of the themes of the beekeeping training program are combined.

A good training program provides guidance and encouragement which stimulate the Trainees to communicate their enthusiasm and knowledge to the people with whom they will be working. To accomplish this, it is important that the Trainees themselves participate actively in all aspects of their training. By taking charge of their own training, Trainees will be better equipped with the skills and confidence which they will need as Peace Corps Volunteers. This is a tenent of this training program and here are some of the means used to carry it out....

Slide #1: The Kenya Top Bar Hive (KTBH) is an intermediate-technology hive consistent with Peace Corps' philosophy of Volunteer extension agents encouraging the use of local materials.

Slide #2: During the first week of training, each Trainee builds their own KTBH, thereby acquiring and/or practicing carpentry skills.

Slide #3. The KTBH requires only minimal carpentry skills and simple tools to build as there is less need for precision than with "high-technology" hives.

Slide #4: Indicative of an experiential training program, this "hands-on" involvement helps the Trainees to begin to understand that with time, patience and limited capital investment, the material necessary to start keeping bees can be effectively acquired by anyone.

Slide #5: Trainees learn that strips of beeswax embedded in top bars are sufficient....

Slide #6: ...to guide the bees to build comb centered on the top bar.

Slide #7: Also during the first week of training, each Trainee establishes his or her own colony of bees in the hive which they constructed. This is accomplished by dividing large colonies.

Slide #8: The Langstroth hive, a high-technology hive, is also managed by Trainees. Experience with different beekeeping systems will allow the Trainees to discern systems most appropriate in their future work situations.

Slide #9: Working and learning together allows Trainees to share observations and enthusiasms while exposing them to a wider variety of situations and possible management techniques.

Slide #10: Peer-directed teaching offers the Trainees opportunities to begin practicing their extension skills.

Slide #11: While as much as possible, the apiary is the classroom, some method demonstrations are held in a more formal classroom situation.

Slide #12: Trainers offer guidance and encouragement but attempt to foster an atmosphere where Trainees draw their own conclusions by observing and questioning.

Slide #13: Trainees establish a glass-sided observation hive and can then directly observe the inner workings of a bee colony. This also introduces the idea of using an observation hive as a valuable teaching aid.

Slide #14: Field trips provide the Trainees with exposure to "hands-on" problem-solving. A low-management situation, for example, might demonstrate a severe wax moth infestation, or....

Slide #15: ...comb constructed on the top of the hive. These experiences allow Trainees to implement the changes necessary to utilize the equipment more efficiently.

Slide #16: Field trips also provide experience in transferring bees from fixed-comb hives to manageable hives. Various types of fixed-comb hives, such as this hollow-trunk hive in Mali, are common in many areas where Volunteers will be working.

Slide #17: Another type of fixed-comb hive is this bark hive in Zaire, ...

Slide #18: ...this box hive in Zaire, ...

Slide #19: ...this straw hive in Mali, ...

Slide #20: ...these mud and stick hives in Tunisia, ...

Slide #21: ...these trunk hives in the Dominican Republic, ...

Slide #22: ...and this box hive in Costa Rica.

Slide #23: After processing their observations on fixed-comb hives...

Slide #24: ...the Trainees should conclude that the first step in transferring a colony is to cut out the comb.

Slide #25: Once the comb is cut out, all good brood comb is either tied to top bars or....

Slide #26: ...tied into frames.

Slide #27: A final footnote to a field trip might occur when a group of young onlookers discover the painful necessity for protective clothing. Trainees might effectively merge community relations with problem-solving by giving away honeycomb samples, emphasizing a more positive aspect of beekeeping.

Slide #28: Marketing hive products should be the obvious end-result of any beekeeping program. Trainees observe marketing practices in the local community and on field trips. These women are selling honey, the major hive product, in a local marektplace in Mali.

Slide #29: Beeswax is another major hive product for use in local, national and international markets.

Slide #30: Trainees learn to make furniture polish and cold cream from beeswax to enhance their understanding of the potential of this hive product.

Slide #31: Pollen is yet another potential hive product and can be collected with pollen traps on the entrances of the hives.

Slide #32: A minor hive product for local use is bee brood which is a rich source of protein.

Slide #33: Other means of emphasizing appropriate technology are to have:
Trainees design and build both a solar wax melter ...

Slide #34: ...and an extractor for use by small-scale beekeepers.

Slide #35: Trainees also learn to make and use a dipboard...

Slide #36: ...to obtain sheets of wax which can replace often rare and expensive wax foundation and ...

Slide #37: ...they also hand squeeze honey from the comb.

Slide #38: Communication is a vital skill for a Peace Corps Volunteer as well as an important aspect in the honey bee colony. Trainees observe communication by capturing foragers leaving an observation hive...

Slide #39: ...feeding them sugar syrup and...

Slide #40: ...marking them with a spot of paint. When the bees return to their hive, Trainees can observe the communication dances through the glass sides of the observation hive.

Slide #41: Trainees develop their own communication skills by preparing extension pamphlets appropriate for small-scale beekeepers, such as these on simple queen-rearing methods.

Slide #42: While preparing the pamphlets, the Trainees carry out the methods of producing queen cells.

Slide #43: Practice in classroom instruction and...

Slide #44: ...use of visual aids further enhances Trainees communication and extension skills.

Slide #45: Bee Fairs are excellent public relations tools for bee development projects and afford the Trainees a final opportunity to creatively use their skills,...

Slide #46: ...such as creating an artificial swarm and...

Slide #47: ...leading the swarm around with a caged queen.

Slide #48: Trainees practice and develop their non-formal education techniques by giving method demonstrations...

Slide #49: ...to members of the local community.

Slide #50: Bee beard contests can be an entertaining means of generating interest for the Bee Fair.

Slide #51: Perhaps a member or two of the local community will volunteer to enter the contest and...

Slide #52: ...the winning beard can be judged on its shape and size and the contestant's composure.

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